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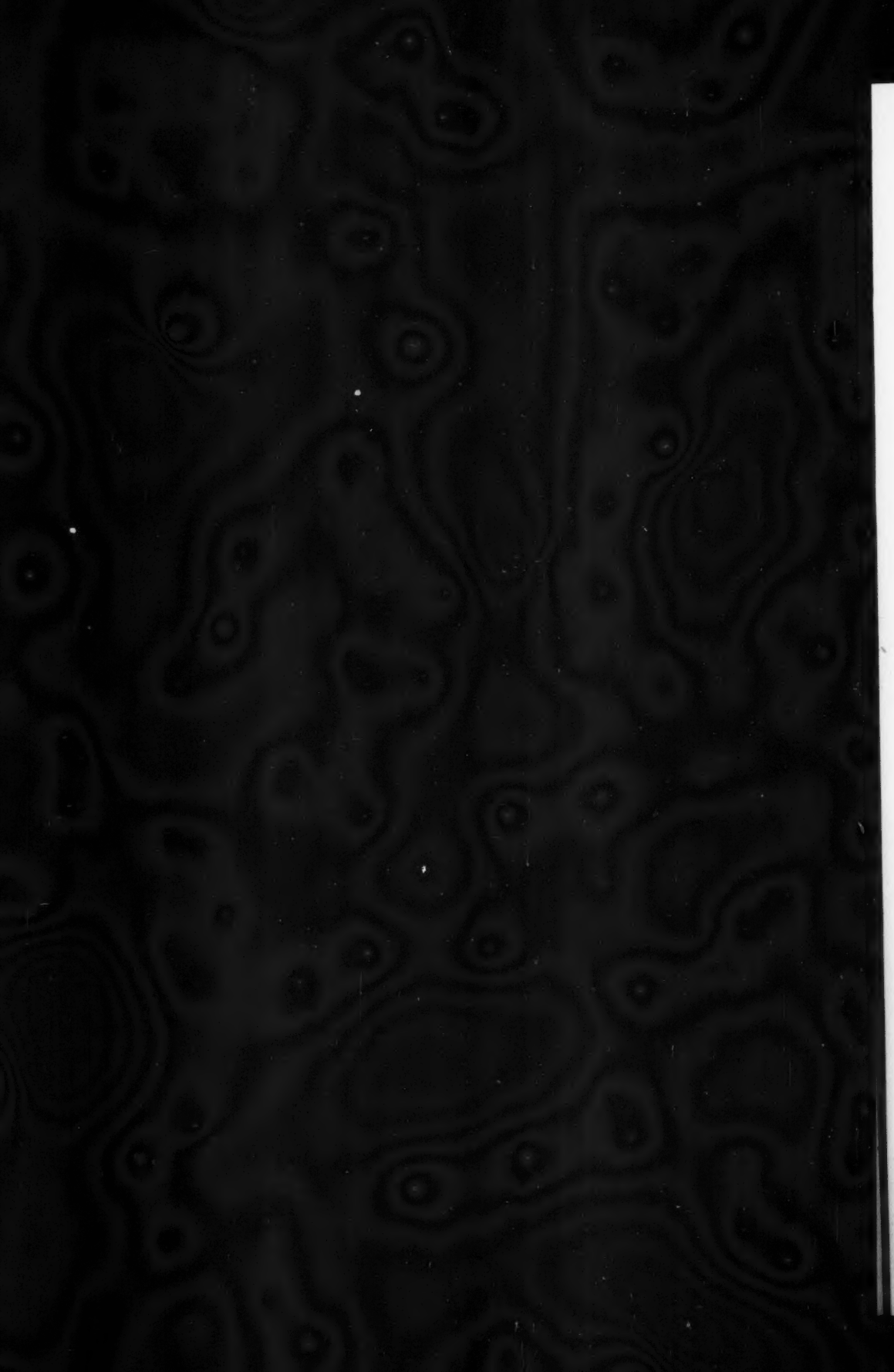
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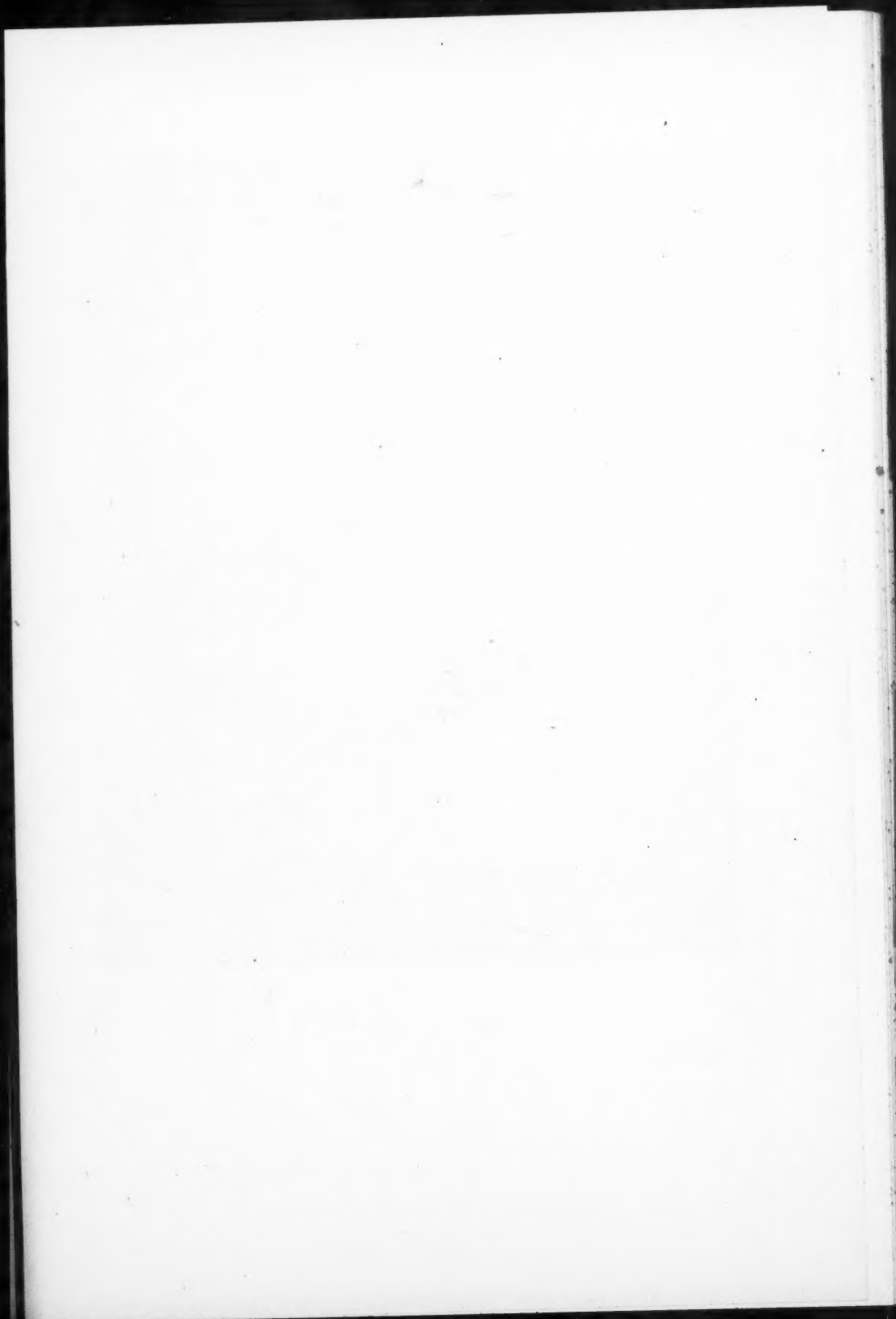
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Spottswood Foster

*From the 1946 Narcissus Show
of the Garden Club of Virginia*

The 1946 Status of Chinese Chestnut Growing in the Eastern United States

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Introduction

The Chinese chestnut, *Castanea mollissima*, now dominates interest among well-informed chestnut planters of the eastern United States almost to the exclusion of other species. Since its introduction in 1906, it has had but one important competitor, the Japanese chestnut, *C. crenata*. Among the world's most important producers of tree chestnuts, only these two species are effectively resistant to blight. However, the Japanese chestnut lacks the palatability to which Americans are accustomed and for all practical purposes it has been rejected in this country. Many small plantings still survive; but this species serves better for shade and ornamentation than for food production.

Description of the Chinese Chestnut

The nut of this species is usually of good size, roundish in form, not pointed at the apex, and with the basal scar smaller than the lower end of the nut. A certain amount of gray down is on the surface. This down may be confined to a small area about the apex or it may cover much of the upper end of the nut, and it may be thick, thin, or scant. The nut may have good cleaning quality, meaning that the kernel and its pellicle are easily separated. Cleaning quality may be good from the time the nut falls from the tree or it may become so only after curing for a time. Once it develops it may remain good as long as the kernel is usable or it may last for a short while only. In texture and in palatability, the kernel of

the Chinese chestnut is not excelled by any other true chestnut. Individual nuts are sometimes sweet from the first but the great majority become so only after being cured for a week or 10 days. Very few nuts of the pure species fail to be sweet when fully cured.

In the open the Chinese chestnut tree attains much the same size and general proportions as does the apple but it may become somewhat larger and more upright. Young seedlings vary greatly in form and are often ungainly and unsymmetrical, but others are all that could be desired with respect to symmetry. Early lack of symmetry tends to become less objectionable as the tree grows older and is seldom conspicuous after one or two decades.

In fruitfulness, many of the seedlings of bearing age are definitely disappointing. Also in many cases the nuts are small. To judge the species by the past fruiting performance of a majority of its representatives in this country would leave little justification for commercial hope. However, there are a good many individual trees about the country whose performance record is excellent and a large number of these are under careful observation as potential varieties.

The species has gained rapidly in popularity since the middle 'thirties when enough good-performing trees began bearing for a fair appraisal of the species to be possible. It was also at about that time that trees for planting began to be available from nurseries. Previously trees could only be had in limited numbers from the Depart-

ment of Agriculture. Today, they are listed in nursery catalogues of one or more firms in each of a half-dozen or more states. The total number of trees yet planted is comparatively small and both planters and nurserymen up to this time have proceeded cautiously because of the newness of the industry and its uncertainties.

Environmental Requirements

The Chinese chestnut requires much the same conditions of climate, soil, and soil moisture as does the peach, but there are indications that it will succeed both somewhat farther north and south. As with the peach, air drainage must be good and frost pockets must be avoided, for while at the latitude of the District of Columbia, the flowering period is from late May until toward the end of June, growth begins early and may be badly damaged in April. This is especially true during such seasons as those of 1945 and 1946 in the middle Atlantic States when summer temperatures prevailed during a great part of March, new shoot growth up to two inches had developed when sub-freezing temperatures killed all new growth and so injured the buds that at Beltsville, Maryland, and general vicinity there were no crops in either year. In some cases young trees were killed outright as were occasional older trees that had become devitalized in some way.

Young trees are so sensitive to lack of soil moisture that sometimes whole plantings are killed by drought. Spring growth is rapid as long as the soil is moist but root development is shallow during the first few years and unless watered, trees are likely to fare badly in cases of prolonged drought. Another serious type of injury, especially to newly planted trees, is sunscald on the exposed sides of the trunks. Probably the best means of prevention is to head

the trees low enough to provide for shading by the tops.

It is said¹ that at the altitude of 2,200 feet in West Virginia, snow and ice frequently cause much injury to young trees. It is a notable characteristic of the species for young trees to retain their leaves during much of the winter. Unless these are removed soon after turning brown, they are apt to become heavily weighted with wet snow and to cause severe breakage. Hail and spring freezes also cause much damage in that locality. The last, however, is not peculiar to high altitude alone as frost injury is frequent at much lower elevations. It was generally in evidence in central Maryland during the springs of 1945 and 1946 as has already been mentioned. This type of injury is easily overlooked, but the cambium will be found dark if a cut is made through the outer bark. Recovery usually takes place rapidly if the injured trees are left undisturbed, but healing will be slow if they are dug up for transplanting or the tops are severely cut back in preparation of the stock for grafting.

Bearing Ages

Young trees may bear a few nuts three or four years after being transplanted, but it usually takes from 10 to 12 years for tops to become large enough to produce profitable crops. While there are occasional trees that become profitable at these ages, there are many that do not. The only significant record of yields yet made public is one reported by Hemming.² His statement shows that 18 seedling trees planted in 1930 bore an average of 29.5 pounds (gross weight) during six of the eight years from 1937 to 1944, in-

¹Verbal statement by Mr. Arthur Gold, of Cowen, W. Va., made during April, 1946.

²E. Sam Hemming, Easton, Md., "Chinese Chestnuts in Maryland," Ann. Rep't., Nor. Nut Growers Association, Incorporated, vol. 35, pp. 32-34, 1944.



*Old Chinese Chestnut, Shantung Province, China;
trees are frequently awkward in habit*



Bearing trees in orchard, Chili Province, China

clusive, when crops were large enough to be separately recorded for each tree. The range in total production per tree for the six years was from 106 to 277 pounds. At an arbitrary price of 25 cents a pound, the average gross return per tree would have been \$7.39 for each of the six crops. The 1944 crop was a practical failure. That of 1946 amounted to about 1,000 pounds, or an average of about 55 pounds per tree.

The Seedling Tree

The original planting stock of the Chinese chestnut as grown in the United States consisted wholly of seed nuts imported direct from the Orient. It was, therefore, inevitable that a period of seedling development should follow. The great majority of the earliest trees grown proved unfit for use as potential varieties, although with some exceptions, they produced nuts that were sweet and palatable. Since the middle 'thirties, superior strains have been introduced, cultural and environmental requirements have become better understood, and the outlook for commercial orchards is much improved.

To a great extent the seedling has served as well as would a grafted tree for the pioneer experimental work that had to be done. It has been far better than no tree at all and even now it has its advantages. With it there is no expense for grafting, no problems of congeniality between stock and scion and those of cross pollination are held at a minimum. Moreover, it must not be forgotten that it is only from seedling trees that superior varieties are possible. In 1946, the year in which this paper is being written, very few grafted trees are available from any source.

The Grafted Tree

The first varietal selections were made in 1930. Quite unavoidably they

were chosen solely by what could be judged from the nuts with no knowledge of the bearing habits of the parent trees. These were first grafted in 1932 and first catalogued in 1935. Already by 1946, some had been supplanted by others of greater promise. Few grafted trees have been brought into bearing and with minor exceptions, it has not been possible to obtain bearing records. It is, however, mainly with the grafted tree that the future of the industry is expected to be built up.

Individual Varieties

ABUNDANCE

This variety was first catalogued in 1941 by Carroll D. Bush, then a nurseryman at Eagle Creek, Oregon. Of the very few trees of this variety sold by him, one went to Mr. Fayette Etter, Lemasters, Pa., with whom it early became a favorite among 7 or 8 he had under test. During 1945 he sent a quantity of Abundance chestnuts to Dr. J. Russell Smith, Swarthmore, Pa., who in turn forwarded 12 specimens to the Plant Industry Station. These arrived October 11 and were immediately placed in a refrigerator. On October 22, they averaged 50 to the pound and ranged from 38 to 76. The appearance was very attractive as the color was a rich brown and there was very little down over the surface. The cleaning quality was also very good and the flavor excellent.

The Abundance has attracted considerable attention and, while it does not appear to be listed in any nursery catalogue, a number of leading growers are using it in top working seedling trees and it may soon be available through regular nursery channels.

CARR

The Carr chestnut originated as one of two seedlings sent by the Depart-



*An erect type, about 40 feet tall, diameter about two and one-half feet;
planted in peach orchard, Shantung Province, China*

ment of Agriculture in 1915 to the late R. D. Carr, Magnolia, N. C. Sixty-two nuts from Mr. Carr were received by the Department in 1930. These

were not especially attractive as the surface was thickly coated with gray down. The lot averaged 58 per pound and the nuts were considered large.

Cleaning quality was very good and the flavor was sweet and pleasing. The variety was immediately named in honor of Mr. Carr although propagation did not begin until 1932. It is believed to have been the first variety of the species ever grafted in this country. The work was performed by H. F. Stoke, Roanoke, Va. Later the Carr became available for several years from a number of nurseries. It was a strong grower but often failed to make good unions with its stock and is not now in general favor.

HOBSON

This also originated as one of two seedling trees sent to a private grower by the Department. This went to Mr. Jas. Hobson, Jasper, Ga., in whose honor it was named in 1930. It was later taken up by commercial nurserymen and widely distributed for several years. It has much in its favor as it is easy to graft, precocious, prolific, annual in bearing, and the nuts are very sweet. Also, the cleaning quality is very good, but the nuts are too small to meet market requirements of this country to best advantage. Furthermore, being small, they are expensive and time consuming of labor, at time of harvest. The average per pound for a lot of 110 nuts received in 1930 was 78. Others received during later years were often smaller. The variety rapidly lost favor with most nurserymen and its propagation was largely if not entirely discontinued. However, for home use, it is much too good to be abandoned at this time.

RELIABLE

Reliable was an introduction of H. F. Stoke, Roanoke, Va., by whom it was propagated for a short time only, beginning in 1938. It is not known to have been catalogued by any other nurseryman. Ten fresh nuts in 1939 aver-

aged at the rate of 79 to the pound. Six days later, after further curing had taken place, the number became 101 to the pound. Aside from having a good bearing record, there appears to be little reason for continuing this variety.

STOKE

This variety appears to be the result of a natural Chinese \times Japanese cross. The original tree was grown by H. F. Stoke, Roanoke, Va., whose attention was attracted to it because of its habit of maturing early. He reports that in southwestern Virginia, burs often begin opening during the third week of August. In appearance, the nuts greatly resemble pure Japanese. The parent tree bears well but the nuts are lacking in good palatability. Insofar as known, propagation has been discontinued.

YANKEE (Syn. Connecticut Yankee)

The Yankee originated as a chance seedling on property of E. N. Hunt, Riverside, Conn. It was first propagated in northern Virginia by Dr. J. Russell Smith, of Swarthmore, Pa., by whom it was first catalogued in 1935. The writer has seen no specimens but according to Dr. Smith, the size and other features are very good. The parent tree is said to bear well and to be hardy where it is located, which is not far from Long Island Sound in the extreme southwestern corner of Connecticut.

ZIMMERMAN

This originated as a 1930 selection made by the late Dr. G. A. Zimmerman, Linglestown, Pa. Very few sound nuts of Zimmerman have ever been produced, for soon after the first crop the identity of the tree became lost and eventually it was destroyed together with others in an overgrown nursery row where it stood. In one known case where there are grafted trees of bearing

age, the nuts are regularly destroyed by weevils. Such nuts as have been seen by the writer have been of a dull brown color and have had surface down only about the apex.

The Zimmerman was first catalogued in 1938-39 by Dr. Smith. It is probable that as many trees of this variety have been sold and planted as of any one variety but performance records are difficult to obtain.

Potential Varieties

Other varietal selections are being made, mainly by the Bureau of Plant Industry, Soils, and Agricultural Engineering from trees at its various field stations. Some of these are already under test as grafted stock in various parts of the country. The most promising will be released to commercial nurserymen as soon as their superiority over existing varieties is established.

Pollination

There is much evidence that chestnut pollen is largely carried by insects although this has not been fully established. The Chinese chestnut is largely, although apparently not wholly, self-sterile; more than a single seedling or grafted variety should be included in any planting. Several seedlings or several varieties would be better. In seedling plantings, all trees that produce inferior nuts should be removed in order to avoid danger of undesirable pollen influence, either on nut characters, or on the genetic makeup of the embryos if the nuts are to be used as seed.

Harvesting and Curing

Chestnuts should be harvested daily as soon as some begin to ripen and drop to the ground. They should be placed at once on shelves or in curing containers with wooden or metal bottoms through which the larvae of any weevils with which the nuts may be in-

festated cannot penetrate and reach the ground. In areas of infestation, these grubs soon begin to bore their way out of the nuts and leave conspicuous holes in the shells. All infested nuts should be promptly burned.

In order to cure chestnuts to best advantage, they should be spread thinly on floors, or on shelves, or in shallow containers as just described, and held in a well-ventilated room. They should be stirred frequently and held for from 5 to 10 days depending both upon the condition of the nuts and the atmospheric conditions at the time of harvest. During the period of curing, the nuts will shrink rapidly in weight and the color will change materially. Both luster and brightness will largely disappear and, although still attractive, the nuts will quickly become dull brown. Three weeks is about as long as Chinese chestnuts usually remain sound without special treatment.

Chestnuts should be marketed as promptly as possible both to minimize deterioration and to take advantage of good prices which are usually highest early in the season.

Storing

Chestnuts in sound condition when stored may be kept fit for eating or planting for several months by any one of several methods. When available, cold storage with temperatures somewhat above freezing is the simplest and generally the most satisfactory method. Stratifying in a wire-mesh container buried deeply in moist but well-drained sand is very satisfactory and successful. Another method is to hold the nuts in a tightly closed tin container either in a refrigerator or in cold storage at 32° F. Burying under a porch or in the shade of a house or even in a bin of grain, preferably wheat or rye, is also a good method. Regardless, however, of temperature or other

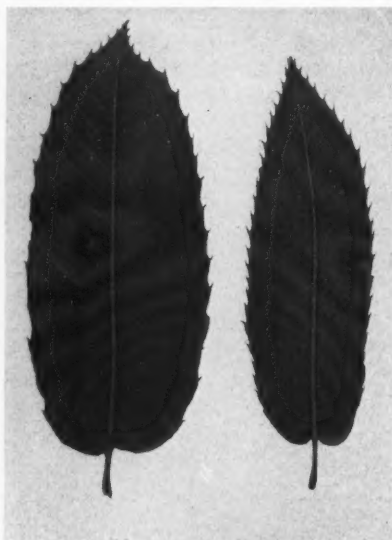
conditions, germination is likely to begin in early March and nuts intended for planting should be hastened into the ground as promptly as possible after that time.

Insect Pests

The two chestnut weevils are the principal insects attacking the nuts. These are exceedingly well-known in certain large areas where the chestnut is grown and in these areas both are often extremely abundant. Unless checked in some way they often render whole crops unfit for use. One of the most effective means of control is to plant trees only in well populated poultry yards; however, in large developments, this is impracticable and other methods must be employed. The weevils have sometimes been called curculios, under which name they were well discussed by Brooks and Cotton.³ The Japanese Beetle is also a serious pest as chestnut leaves are among its favorite foods. Control methods have been given by Hadley.⁴ Another insect pest which feeds on the leaves is the June bug or May beetle. It works mainly at night and feeds on the newest leaves. It is seldom seen and usually disappears about the time when the operator becomes aware of its presence.

Diseases

Blight is the disease attacking the chestnut tree with which the public is most familiar. The Chinese chestnut is strongly resistant although not immune as few old trees entirely escape attack in areas where blight is prevalent. In most cases healthy vigorous trees of this species overcome the disease within a few years after being attacked. The ones that die are usually those that have been devitalized in



*Typical leaves:
Chinese (left) and
Japanese (right)*

some way. The nuts are subject to attack by any of several diseases either before or after the harvest. A preliminary report on these has been made by Gravatt and Fowler.⁵

Present Extent of Planting

With few exceptions the known plantings consist of small numbers of trees about residences. Occasionally there are one or two hundred trees in orchard arrangement. Production is not large and in most cases all sound nuts are either consumed locally or used by nurserymen and others for planting. The quantity that has reached the wholesale market is known to be small although a beginning in that field has been made.

Future Outlook

Extensive expansion did not appear

³Fred E. Brooks and Richard T. Cotton, "Chestnut Curculios." U. S. Dept. Agr. Tech. Bul. 130. 1929.

⁴C. H. Hadley, "The Japanese Beetle and Its Control." U. S. Dept. Agr. Farmers' Bul. 1856 1940.

⁵G. F. Gravatt and Marvin Fowler. Nor. Nut Growers Ass'n. Proc. 31:110-113. 1940.



Chinese Chestnuts, grown in Maryland



*Healed wound from Chestnut blight
on Chinese Chestnut*

possible at any time soon until after the 1946 crop had been harvested. This was unexpectedly large and a number of tons are known either to have been planted immediately or set aside for planting in the spring of 1947. It is conceivable that annual production of nuts available for seed purposes will increase rapidly. In this case, the extent of planting within the next few years will be entirely a matter of speculation.

Extensive planting in the early future cannot be considered economically safe for in addition to the usual number of problems that must be solved in

establishing any new horticultural enterprise, chestnut growers must expect keen competition with imports from both Europe and Asia. At the outbreak of World War II an average of more than 16 million pounds of chestnuts were yearly being imported into this country.⁶ These imports will doubtless again appear with the return of normal international relations.

Furthermore, almost an exact half-century ago, the chestnut outlook was regarded as being so bright that it could hardly go wrong. During the middle and late 'nineties extensive chestnut developments were established in certain eastern districts mainly by use of Paragon and other varieties of European parentage. Thousands of small plantings were developed about home grounds and occasionally there were large orchards. The greatest developments were conducted by top working suckers that sprung up from stumps of native chestnut trees on cut-over mountain land. Hundreds of acres were handled in this manner. Without exception, all ended in financial disaster.

Summary

The nut of the Chinese chestnut is an excellent product. It is unexcelled in sweetness and general palatability by any other known chestnut. The tree bears well and is about equally as hardy as the peach. It appears to require much the same conditions of cultural environment as does that species. It is practically the only species of chestnut now being planted by informed growers in the eastern part of the United States.

It is thus far grown in this country almost entirely as a seedling tree. Variation is about what was to be expected, with the majority of bearing trees proving to be poor producers and, in most

⁶Computed from Table 541, p. 413, Agricultural Statistics 1938. U. S. Dept. Agr. 19

cases, with nuts too small to sell well.

Varietal selections of much promise are being made; the first appeared in 1930 and were first catalogued in 1935. Some of the earliest have already been dropped as their defects came to be known, and others of greater apparent promise have originated. The process of selection is constantly going on and further introductions should shortly appear.

By taking certain simple steps chestnuts in sound condition may be kept in usable condition for many weeks.

The Chinese chestnut is subject to attack by certain serious natural enemies. These include both insects and diseases and the tree as well as the nut is affected. However, all that are now known appear controllable.

Past planting has been largely limited to small numbers of trees mainly about residence grounds. The total number of trees available for planting has never been large, due chiefly to

the scarcity of seed nuts needed for nursery use. Production, however, rose sharply with the harvest of the 1946 crop which was unexpectedly large. Annual production may continue to increase since the number of trees of bearing age is likely to become appreciably greater each year. Nursery planting is likely to be proportionately greater. The extent of future planting will doubtless be correspondingly influenced.

Present enthusiasm over the Chinese chestnut is very great and it is possible extensive planting may soon take place. It is believed, however, that this would be unwise from an economic point of view. There are many uncertainties in connection with the industry in its present state of development, and not improbably there will be keen competition in the market with imported chestnuts from both Europe and Asia as soon as international relations become normal.

More Regarding Hardy Cyclamens

ALFRED BATES

Of growing cyclamens I have nothing to boast—that is so far as possessing blooming plants; but during the seven years prior to the time when the war cut off our supply of foreign seed I gained no little experience in the growing of them from seed, which now that it may again be had will hold me in good stead. Miss Livingston's article in the July issue of this magazine (p. 284, 1946) spurs me on to write, rather prematurely, of my failures as I think I have learned how to handle them and my conclusions may be of help to those who would like to go the cyclamen way.

Plant conscious children are usually attracted to flowers of a set pattern and dainty form such as the old fashioned greenhouse cyclamen—not the bloated ragged monstrosities of today—and I adored them from the first time I saw them with a love that has been constant. Years later in a second-hand bookstore I found Margaret Waterfield's *Garden Colour* and saw her lovely paintings of broad sweeps of *C.C. coum* and *neapolitanum* and the desire to grow them became a major complex of my garden life. But I was unable to get plants or seeds and older and more experienced gardeners, with one accord, insisted they could not be grown in this country—I refer to the middle Atlantic states. It was not until the late twenties that I found them in goodly numbers in Thompson & Morgan's seed lists and then in Correvon' and in Barr's.

I had been collecting what meager information I could from English garden books but the very things I needed most to know—soil, aspect, depth to plant, how to handle the young seed-

lings—I could not learn. So I started blindly — trusting my garden sense which in this case played me false — and ordered several species in 1933. Before going into case histories it may be well to give a rough summary of the genus.

Cyclamens belong to the Primrose family, the only genus therein which grows from a tuber (and a peculiar kind of a tuber) not a corm as is often stated. (A corm makes a new corm annually, may sometimes make more than one and also makes offsets; in other words it multiplies itself.) Nicholson calls it "a circular compressed perennial rootstock." It can multiply by seed only. The foliage and blossoms spring from one point only at the top of the tuber and they increase in number as the tuber increases in size. E. A. Bowles, writing in 1913, tells of one which his mother planted more than fifty years earlier and was, when he wrote, larger "than the inside of a man's hat" and Canon Ellacombe had some in his garden which he knew positively to have been more than eighty years in the same spot.

Some one or other species in the genus may be had in flower at almost every month of the year. Authorities are rather vague as to which months each species blooms and do not always agree thereon; but a rough schedule would be something like the following. *C. europæum* blooms from June or July through early September; *C. neapolitanum* (syn. *hederæfolium*) starts, without leaves, in late August and continues through November when its foliage is fully developed; *C. cilicicum* comes into flower in October and may last until January when *C. coum* bursts forth

and continues into April, according to some; *C. ibericum* appears in February and may last until late April; *C. repandum* begins some time in late March and holds forth "until full summer is approaching" as A. T. Johnson vaguely remarks. *C.C. græcum* and *cypricum* are autumn blooming. And there are others. As nearly as I can determine there is a gap between *C.C. repandum* and *europæum* and perhaps the month of June is cyclamenless unless *C. persicum*, which Farrer intimates was hardy in his Yorkshire garden, in its unhybridized form, may be in flower then. Truly this is a genus to bring into our gardens as speedily as possible both for our own enjoyment and for the pleasure of our grandchildren—if our civilization has become stabilized for them.

Writers are by no means unanimous as to which of the species have fragrance excepting *C. europæum*; and this one they all agree is the sweetest—"with the odor of violets" as one declares. As Nicholson says "very fragrant" for this species and "inodorous" for *C.C. coum* and *persicum* we may conclude that some degree of fragrance exists in the other species—until we can decide for ourselves.

In spite of the statement in The Standard Cyclopedia of Horticulture that they "would be more popular were they hardy in our eastern climate" I am certain they *are* so, save perhaps *C. africanum* which comes from Algeria, at least as far north as Poughkeepsie, N. Y., where I saw *C. neapolitanum*. Hardy, *provided* one's garden is not subject to late frosts and they are planted in soils with sharp drainage and under the protecting branches of deciduous or evergreen shrubs; and in the case of *C. repandum*, with tubers tucked in under stones—a method suggested by Sir Arthur F. Hort for that

species. Perhaps it would be an advantage to treat all the others this way, placing the tubers about an inch or so inside the outer edge of the stone; I have found it produced results when used with *Anemone blanda*.

My claim as to late frosts is based upon the statement of an old Swiss nurseryman. Southwest of Madison, N. J., is a long valley with a range of hills to the west. In this valley the Swiss had his nursery. When asked about the hardiness of this genus, his reply was, "I cannot grow them here for the late frosts kill them; but about a mile or so away, up on those hills, a friend of mine grows several species beautifully."

All English writers with one accord claim that cyclamens will grow in any well drained soil; that while they appreciate lime it is not necessary. But reading between the lines I conclude that it *is* essential for *C. europæum*. This species has become naturalized in some parts of England but always on limestone or chalk. Farrer claimed it for his Yorkshire garden which was on limestone; Sir Arthur Hort grew it on his chalk; E. A. Bowles has it and his garden's soil is more alkaline than acid; but A. T. Johnson could not succeed with it in his acid soil in Wales. In its native homes it is found on limestone formations only.

Growing naturally under shrubs, they have accustomed themselves to a diet of decayed vegetable matter and should be given leaf mold, commercial humus and very well rotted old manure. Beside the shelter of overhanging branches, it would be well to place them where they would be shaded from the morning sun in winter and spring so foliage and flowers will have a chance to thaw before the sun reaches them. This last point is very important here in America where our win-

ters are severe, often with no snow covering, and our sun is much hotter than in England or in their native haunts. Growing in stony soils, they insist upon sharp drainage and during their resting periods the soil may become bone-dry; Bowles speaks of them under a Scots pine where the earth becomes so dry that sparrows take dust-baths in it. In their natural habitats they grow under shrubs whose roots take the moisture from the soil, among rocks where the drainage is sharp and, save for *C. europæum*, in countries where summer droughts are severe. After they have once been established in a garden it would be well to give them no water other than what nature provides in the summer rains. The principal points of this information I had before starting with the seeds; but I still did not know how old the seedlings should be before setting them out nor how deeply they should be planted. Also I did not expect them to behave as they did in the seed pots; but of that later on.

Seven-inch azalea pots were used, they give the seedlings an inch more of soil than bulb pots—a great benefit if seedlings are left in them for over a year; a good half-inch of rather finely broken potsherds placed in the bottom with small bits of charcoal scattered over them. The soil used was in the proportion of three quarts good light loam, one quart Hyper Humus and a large handful of bone-meal. This was pressed firmly into the pot until about an inch from the brim and covered with half an inch of coarse builder's sand, never fine sand. The pots were then placed in pans or deep plates and thoroughly sprinkled until water seeped through into the pans and were left there overnight; in the morning they were taken out to dry until evening. Or I might have begun in the morning and ended the following morning; the idea

was to give them twelve hours of becoming thoroughly wet and twelve of draining before seed was planted. All subsequent watering was done by standing the pots in water until moisture appeared on the surface. The pots were prepared upon the arrival of the seed which means in late January or early February if orders were sent in as soon as the foreign catalogs arrived. I have never been able to see any wisdom in saving seed until spring before sowing it; nature sows her seed at once so that it gets the benefit of snow action and frost. I was working in a city apartment and had no use of a cold frame or I should have sunk the pots there and allowed them to be frozen and covered with snow. As it was, several times during the years of cyclamen sowing I brought in snow and banked it on the pots. As soon as the pots were filled and in soak, each package of seed was emptied into a small dish or glass of water to which a small pinch of Semesan had been added. The glass ramekins in which custards are baked are excellent for this purpose. I purloined mine from the kitchen, "borrowed" them without permission, and after the clouds resulting from the discovery had rolled away they were mine for life: "No vessel that has been used for your messes can ever be used again for cooking." It is marvelous how many kitchen utensils and implements a mere man may appropriate for garden usefulness if he goes about it innocently. I soak all large seed in these ramekins in Semesan solution, even lily seed which in the moist state is rather tedious to plant; of that, too, more hereafter. When the pots are ready for planting the seed will have been soaking for a day and will have plumped up to their natural size as when they were first ripe and many will have even increased in size

for they have begun their process of germination. By this method one gains as much as four months over an April sowing.

Planting of the seed is done by first draining off the solution and then carefully lifting out each seed with tweezers and placing it an inch apart in inch wide rows in the seed pot. Dry sand is then spread over the seed until the pot is filled and pressed down; this will leave the finished surface a little below the rim of the pot. I have never used peat moss as Miss Livingston does, nor added sand to my soil because humus has a much greater food value than peat moss and my loam is light enough to need no sand. As many of the seed packets are small several species are planted in the same pot with an inch wide strip of zinc as a fence between.

Spacing the seed an inch apart allows ample space at transplanting time to lift out each plantlet with but little disturbance of the roots. For transplanting an ordinary 5 & 10 cent store fork is used. These same forks make excellent grubbing tools for stirring the soil between small seedlings of any sort by merely bending the tines forward about three-quarters of an inch from the points; also, by filing off the two outer tines a narrow two-pronged digger, or grubber, may be made. I am not referring to the long-handled and long-pronged wire kitchen or cook's fork, which is also a very handy tool for larger scale work, but to cheap forks of ordinary table size.

As the seed germinates the developing roots lift it to the top of the soil. In my ignorance I forced each one as it would come into view back down into the sand — thereby breaking the roots. All my 1933 sowing was lost through this stupidity. At that time *Galanthus Ikariae* was lost also. I still

do not understand why cyclamens and this snowdrop act this way—I have not noticed it with other snowdrops—unless the developing tuber or bulb needs direct light at this stage of growth. All subsequent plantings of cyclamen acted in the same manner and what is even stranger they did not grow down into the soil later on—even when two years old; but more of this later.

The second trial germinated well in mid-February and by the end of June some were getting a second leaf. I went away over a long weekend, leaving the pots in water, carefully gauged through past observation—for I had often left them thus before—but this time the weather developed a hot drying wind and when I returned the pots were bone dry and every seedling was lost.

At this point it might be well to describe the appearance of the seedlings and their manner of growth so those who wish to try to raise them from seed will know what to expect. As the seed is lifted to soil level it not only grows larger but becomes almost transparent, with no stretch of poetic license it could be described as a gleaming and translucent little pale opal with a tiny green leaf no bigger than the ear of a baby mouse perched on top of it. As the months pass both leaf and tuber increase in size but the tuber does not lose that translucent appearance even when in late July and early August the second leaf develops. After that the roots do not draw it below ground; I have had pots in the apartment until their second year was well advanced and still the little tubers remained on the soil. And what is more they did not take a period of rest but continued to hold their foliage throughout that time. Perhaps it was due to being indoors; but they were kept in the bed-

room where the radiator is never turned on and the door was kept closed.

It was this remaining upon the surface which caused my next two failures. The third year's sowing was planted out under a lilac and under a mahonia in late August; as the little tubers were still on the surface they were so planted and when I next came back to the garden they had all been eaten by birds. The fourth year's planting was set out in the same spots as before in late October and still with tubers at ground level but this time they were carefully covered with about half an inch of humus and crushed dry leaves. I still had been unable to find directions as to depth for planting of either full-grown tubers or seedlings and as greenhouse cyclamens and my seedlings were on the surface I was afraid to plant them deeper. They were all alright when I went home at Thanksgiving but at Christmas, there had been several cold spells with thaws between, they were sad looking affairs. The thaws had heaved them out of the ground for the birds' delight and what few were still left were shriveled and wilted, they were thrust back into the earth and deeply this time but there was little life left in them.

The fifth year's efforts I resolved to hold until over two years old and, come what may, plant them several inches below soil level. They were set out the June of their second year with tubers three inches deep even though it meant covering the leaves of some. They did well that year but a few on the outer edges of the groups where the leafmold mulch wore thin did not come through the winter. I last saw them in late April for I was unable to get down to the garden until early July and in the meantime an old dorky who frequently did odds and ends about the place had weeded that part of the garden—and done a good job; cyclamens

were completely beyond his garden lore. No seed had been sown that or the previous spring and by the next Europe was at war.

Germination was always excellent in the following species: *C.C. neapolitanum*, *cilicicum*, *colum*, *gracum*, *repan-dum* and *ibericum* and there was no mildewing or any other loss until they were planted out. Only once did I have *C. europaeum* and it did not germinate for the seed was old and badly shrunk, the soaking failed to plump it up much; perhaps it might have shown some life had I given it time and sunk the pot in the garden over winter; so large a seed as cyclamen does not lose viability easily.

Starting from scratch now I shall follow this routine: sow seed as described above; grow seedlings in seed pot until the late spring of their second year; plant them out three inches below soil level—if leaves are too short for this depth cover them to their tip and gradually fill in as the leaf stem lengthens; plant in well drained soil that is rich in humus and to which bone meal has been added. The places chosen for their homes shall be overhung by the branches of deciduous or evergreen shrubs or trees, care being taken to protect them from the early morning sun. And I shall try to use two or more species in drifts through the colony. It seems to me there is no reason we should not grow this charming genus here in America especially when they come so readily from seed.

And grow them in goodly number for merely one or two look rather ridiculous and very lonely like lost souls pining for the hosts of heaven. A sweep or drift of them is what we should strive after for then they can show their true beauty, jewel-like as they sparkle on the bare ground or amid their lovely foliage or in the company of small ferns.



The White "Desert" Evening Primrose

The Flora of the Colorado Desert

ROBERT M. SENIOR

To one interested in plant life, that part of southern California north of the Mexican border, and west of the Colorado river, for possibly a hundred miles, is a region of very considerable interest. The traveler living east of the Rocky Mountains, when visiting this section, finds a plant world with which he is entirely unfamiliar.

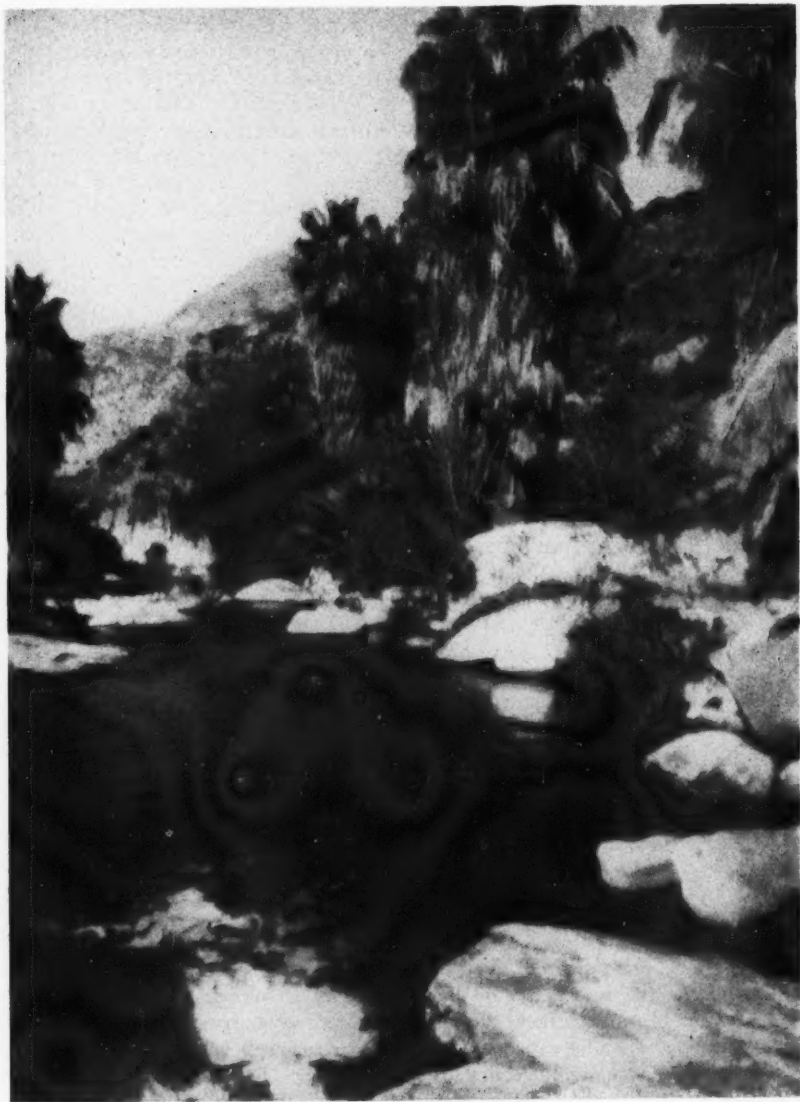
Although this section is called the Colorado Desert, it must not be thought of as a sandy waste, such as the greater part of the Sahara Desert. In the main, it is a semi-arid country, traversed by several mountain ranges, where the rainfall is usually less than six inches a year, and where the summer heat is excessive, in some parts attaining a

temperature of more than one hundred and ten degrees Fahrenheit. In contrast, the winters are delightful, with heavenly blue skies, and pleasant warm days, and cool nights. Here, in recent years, the date industry has grown with great rapidity, and in many places the plantations are like charming oases. It is said that in this section, the growing season for crops is 365 days a year. Numerous winter resorts have sprung up, of which Palm Springs, with its many hotels, is probably the best known.

In the early Spring, sometimes in late Winter, depending on the advent of rain, this desert springs into bloom. Like magic, the low rose colored *Ab-*



Opuntia Bigelovii and *Encelia farinosa*



Washingtonia palms growing in canyon

ronia villosa, the white *Oenotheras*, the blue *Phacelias*, the tiny desert *Asters*, *Gilias*, *Eschscholtzias*, *Calochorti*, and scores of other low growing plants adorn the landscape. It is amazing how some of these plants can endure long continued drought and spring into life again with the first rainfall.

Anyone interested in the *Cactaceae* would find numerous specimens of *Opuntia*, *Cereus*, *Mamillaria*, and *Echinocactus*. Among those frequently encountered, we might mention *Opuntia Bigelovii*, with its brilliant reddish flowers, *Cereus Engelmannii* with somewhat similar colored flowers, *Echinocactus acanthodes*, the Barrel Cactus, and *Mamillaria tetrancistra*, the Fish-hook Cactus, with pink flowers.

A visitor to this region is rather surprised to find ferns, which have to endure months of heat and drought, with fronds that during the summer are brown, and crumble in the fingers. Often growing at the base of rocks, which no doubt give them some shelter, we have found ferns belonging to the genera *Notholaena* and *Cheilanthes*.

In some of the narrow canyons, where frequently the earth retains a certain degree of moisture, the endemic Washington Palm, *Washingtonia filifera*, grows. On the desert, however, no trees attain any considerable height. *Cercidium floridum* and *monophyllum*, the so-called Palo Verde, when in bloom, are covered with yellow flowers. The leguminous *Prosopis chilensis*, commonly called the "Mesquite," with yellow flowers and narrow pinnate leaves, usually flourishes where there is some ground water. Frequently desert springs are located in their vicinity. As for the shrubs, the Creosote Bush, *Larrea tri-*

dentata, with yellow flowers and dark brownish-green leaves, its widespread throughout the desert. It is a remarkably drought resistant bush. It is reported that in some sections where there was absolutely no rain for two years, the plant managed to survive. Possibly the bush most frequently seen in the Palm Springs area is *Encelia farinosa* with its yellow daisy-like flowers, that throughout the Winter and Spring are widespread on the desert and on the lower reaches of the mountains.

If anyone in the eastern States were interested in growing the herbaceous plants of this section in a greenhouse, he could unquestionably have success with a large number of them. The writer, in a small Alpine house, that, during the winter, is kept at a temperature of 40-50 degrees Fahrenheit, has raised a considerable number of these plants. In the late Spring, some of these are set out in the garden, while others have remained the entire Summer in the slightly shaded greenhouse, where they seem able to endure a temperature that sometimes rises to 100 degrees.

One could well devote a small compartment in his greenhouse to this "desert" flora. The choice of plants would be large, and among those that would prove very attractive are the rose colored Sand-Verbena, *Abronia villosa*, the white "Spectacle Pod," *Dithyrea californica*, the beautiful white "Desert Primrose," *Oenothera deltoides*, as well as the yellow Evening Primrose, *Oenothera cardiophylla*, the prostrate purplish red *Nama demissum*, and various *Gilias*, *Phacelias*, *Amsinckias*, and *Chaenactis*. Possibly if any reader should desire to raise some of these plants, the writer could furnish small quantities of seed.



Walter Beebe Wilder

Indoor Storage Pit for Plants

HELEN M. FOX

Gardeners who live in a northern climate and like to grow half hardy plants unable to withstand frost out of doors have to provide a place in which to winter them. Here the cellar has not proven satisfactory for most plants

for some of them remain active and keep on producing flowers so they require light as do jasmine and rosemary which have to be brought in doors before they flower.

A room-like enclosure was built for

these plants heated only by the sun and it has proven so satisfactory that it would be impossible to grow the whole gamut of half hardy plants without it. This room which we call a "pit," though it is more like a cave with a glass roof, is entered from a cellar with a concrete floor under a building which houses an apartment upstairs and consequently is dry and pleasant all winter long. The ground under this building slopes steeply to the east. The pit faces south and is parallel to the greenhouse which is entered from the same cellar but is situated further east and lower down the hill and is so small it is almost filled to capacity with seedlings and cuttings. The roof of the pit is composed of several standard sized glass sashes which can be easily slipped in and out of permanent wooden frames. This roof is flush with the surface of the ground and slopes towards the south. The floor of the pit is of concrete and nineteen inches thick and has a large drain in it. The dimensions of the pit are six feet eight inches by fifteen feet; the height at the back is nine feet and at the front about six. There are two wooden shelves all around except where the door is cut out, the first is six feet seven inches below the roof so that a two foot high plant standing on it would be well below the frost line which is four feet here. Plants are stood on the shelves as well as the floor. Those which do

better in a light situation stand facing south and those which prefer shade face north. Tuberous begonias cannot be put on the top shelf but are perfectly safe on the lower one.

In the pit are wintered many plants and bulbs among them primulas, cyclamen, gardenias, begonias. Rare geraniums are sometimes carried through without making cuttings, as are the delicate lavenders such as *abrotanoides* and *dentata*, rosemaries and fuchsias. They all stay in the pit until they begin to flower when they are moved into the house. Here, too, are cuttings of many plants not hardy out of doors such as some of the penstemons and salvias. Oleanders spend the winter happily in the cellar as do bay trees, while camelias are moved from the cellar to the greenhouse when they are about to flower.

The pit is watered thoroughly once a week and dusted about every two weeks with insecticides, oftener if necessary.

When the temperature goes below fifteen degrees the roof is covered with feed bags filled with straw. Sometimes snow freezes the bags on tightly to the roof and they have to remain for several weeks, but the temporary darkness does not hurt the plants. On warm days the sashes are opened for air which is very important to prevent mildew.

Rock Garden Notes

ROBERT C. MONCURE, *Editor*

A Hybrid Penstemon for the Rock Garden

The production of new plants for our rock gardens through the hybridization of native species is a field in which there is great promise. One such plant, \times *Penstemon edithae*, is hereby presented to the rock garden world, its beauty of flower, foliage and form giving it distinctive value.

Two species of *Penstemon*, native to the Pacific Northwest, are its parents. *P. rupicola*, the maternal parent, is a depressed shrubby minutely hairy rock lover, with branches 10 to 25 cm. long, numerous small glaucous and usually sharply toothed leaves, its flowers, in the more attractive variants, being intensely pink. This was first described as a variety of the Californian *P. newberryi* by C. V. Piper in 1900 from plants collected on dry rocky cliffs of Mt. Rainier, Washington; then in 1901 Thomas Howell raised it to species rank. It is now known in the Cascades from Washington to northern California. This species is a handsome rock garden subject although its rather prostrate habit somewhat limits its usefulness.

The paternal parent, *Penstemon barrettiae*, a coarse, robust species, occurs sparingly in two limited localities, near Mosier, Oregon, and on the opposite side of the Columbia river, in Washington. It was first collected by a Mrs. Barrett and named by Asa Gray in 1886. This species is characterized by shrubby, upright stems, several decimeters high, wholly glabrous growth, large slightly toothed glaucous leaves,

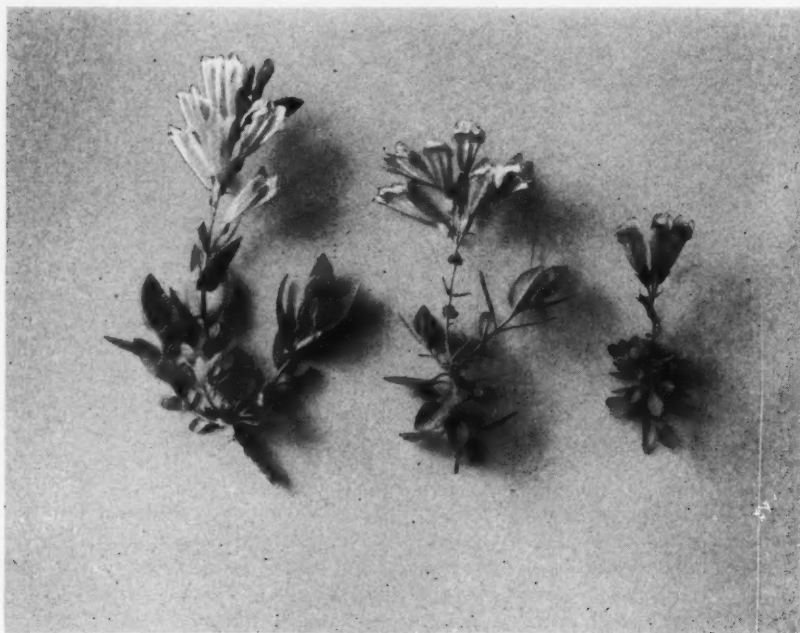
and light purplish pink flowers. Although the latter are pleasing in form, their color is not especially desirable in the garden.

The idea in crossing these two species was that it might be possible to obtain a vigorous, upright plant with the attractive flower color of *Penstemon rupicola*.

The cross was made in the spring of 1929, and just two seedlings were obtained. One of these, which had more of the characteristics of *P. rupicola* unfortunately died. The remaining one grew to healthy maturity, and bloomed at the age of three years. It proved to be an exceptionally vigorous plant, which, like many hybrids, blooms more freely than either of its parents. Its upright stems are about 1.5 to 2.5 dm. in height, well supplied with lovely glaucous leaves midway in size between those of its parents; they are glabrous and but slightly toothed, as in *P. barrettiae*. Its cherry-pink flowers are produced in abundance over a long period.

While the two parent species are related, a first generation hybrid might have been close to one or the other of them; it was, therefore, a pleasant surprise to obtain a plant which blended the best features of both parents right at the start.

As would be expected, it has been found that \times *Penstemon edithae* does not come true from seed, so it must be propagated by cuttings. However, like its parents, it is easy to multiply in this manner. It prefers full sun (at least, here in the Northwest), good drainage, and rocks on which the basal foliage may rest.



Edith Hardin English

× *Penstemon Edithae*; (lower) left to right, *P. Barretiae*,
× *P. Edithae*, *P. rupicola*



Edith Hardin English

× *Penstemon Edithae*

× *Penstemon edithae*

(*P. rupicola* ♀ × *P. barrettiae* ♂)

Planta glabra ramosissima, globum latum depressum formans, 1.5 - 2.5 dm. alta, foliis glaucis dentatis inter parentes intermediis, floribus rosaceo-purpureis 35 mm. longis.

Named in honor of my wife, Edith Hardin English.

Specimens: No. 2397, May 10, 1934; No. 3035, May 19, 1935 (TYPE), in herbarium C. S. Jr. and E. H. English, Seattle, Washington. A clastotype deposited in herbarium Academy of Natural Sciences of Philadelphia.

CARL S. ENGLISH, JR.

Campanula Porscharskyana

Campanula Porscharskyana is a comparatively recent introduction into England and America from Dalmatia, being introduced in this country by a well known Oregon nurseryman. This species belongs to the same group as *C. garganica*, but is a stronger, more rampant and less difficult plant than its relatives, and when better known will probably be universally planted in dry walls and large rock gardens, and possibly as a border edging, especially where the summers are hot and dry. One could scarcely find a more foolproof plant, requiring no coddling and asking only to be given good drainage. Here is a plant for both the novice and the connoisseur. It has rotund-cordate leaves with deeply serrated margins on longish footstalks, trailing on long graceful arms profusely covered with flowers in loose axillary racemes. Clear lavender blue, widely expanded and star shaped, the flowers form a mantle of entrancing beauty, often carpeting as much as two or three square feet in area. Propagation may be made with the greatest of ease by division or cuttings, either in early

spring or fall. This plant is seemingly adapted to a variety of climates, having proved equally successful in the mid-South, the Pacific Coast, in New England, Ohio and northwestern Minnesota.

Campanula Porscharskyana has been growing in my garden for four years under many different conditions, but all of them well drained, growing most rampant in partial shade in a mixture of peat moss, leaf mold and sand, the latter forming the majority of the mixture. Also it has shown sturdy growth in dry heavy sun-baked clay to which a little leaf mold has been added and where at times there was no rain or artificial watering for as much as three weeks at a time during the summer. In fact, this campanula has shown itself to be unbelievably drought resistant. The blooming period in my garden begins about May 20th and continues profusely for a month to six weeks, at which time if the plants are sheared and not allowed to go to seed and given moderate amount of moisture they will bloom again late in July and if again sheared in about two weeks will bloom again from late September until frost.

ROBERT C. MONCURE.

Alexandria, Virginia.

One of the things that the editors would like to have from members is a series of pictures that would show the typical rock formations of their respective regions, which do or should suggest the basic scheme of composition in any rock gardens that are to be built in the area. Not all rock formations are equally suitable for the garden planner to imitate, but it often happens that a close observation of the natural formations will give the gardener a better sense of the ideals toward which he should strive in planning his own work.

Rhododendron Notes

CLEMENT GRAY BOWERS, *Editor*

Some New Rhododendron Crosses

I started my Rhododendron experiences in Alaska many years ago. There I was limited to the more hardy species. I have been in Seattle for the past fifteen years. During all of that time I have grown seedling Rhododendrons from crosses. I have seedlings growing on my place from about three hundred crosses that I have made myself. I have a large group of Asiatic and other species and these were used for hybridizing. My collection of the Asiatic species and their hybrids is perhaps the largest in the country at this time.

Seattle is very good Rhododendron country. We have lots of moisture and the winter temperatures are mild enough. On the highest ridges in the territory the temperature will drop to zero in a severe winter, but this is unusual. At the waterline the minimum is usually around ten degrees above. Our average temperatures will run well above freezing for the winter months. Forty to fifty degrees above are not unusual temperatures.

Some years ago the English tried crosses of the Asiatic species with the more hardy American species. Results were not very satisfactory, and you will find very few of those crosses growing in England today. But similar crosses have been made in this country, and we have some very good hybrids from these efforts. Some of the plants from these crosses will stand temperatures of thirty degrees below zero. A group of nice hybrids this hardy would be a wonderful thing for certain sections of the United States.

Since the public is taking a keen interest in the new hybrids, I shall de-

vote the remainder of my space to the description of some of my finest varieties. The ones I want to talk about are those grown from seeds that were sent to me from England by a friend who has had wide Rhododendron experience over there. Altogether I have received seeds from about one hundred English crosses. *R. Griersonianum* was a parent plant in about thirty of these. This is one of the finest species to be brought out of Asia. It is a strong grower and flowers when fairly young. The flowers are very fine. They have an attractive trumpet shape and the color is a bright geranium scarlet. This is not a color that is too common in Rhododendrons. The crossing habits of this one make it very easy to work with. Excellent results can be obtained by crossing it with a goodly number of both species and hybrids. But unfortunately the species itself is not dependable for hardiness in many locations around here. It will winter kill at about ten degrees above zero. But the plants obtained from crosses made with *R. Griersonianum* and the hardier species and hybrids do give a good account of themselves for hardiness.

For the benefit of those who are unfamiliar with the habits of Rhododendron seeds obtained from crosses, a word of explanation will be necessary. There is a wide variation in both flower and foliage of plants obtained from identical crosses and even from plants growing from the seeds in the same seed pod. I am growing an average of about thirty seedlings from each cross that I propose to discuss. This number offers a good chance for securing some seedlings of the highest type of each cross. With the exception of *R. Tally*

Ho and *R. Azor* no plants of any of the crosses in the following list have been imported from England. While the production of a plant that is the highest type that a given cross will produce is usually the results of persistence in the matter of the number of seedlings grown from the cross, yet there is also a strong element of chance in the matter. So it could be that some of the seedlings that I am growing may turn out to be very superior types.

The group of seedlings that I want to describe first came from the cross between *R. Griersonianum* and *R. Britania*. This one has been named *R. C. P. Rafill* in England. It has nice large flowers about the size of those of *R. Pink Pearl*. The flowers are very attractive in form. They are bell shaped, rather wide and open and are slightly frilled. The color is a wonderful shade of beautiful bright red. The flower has good texture which makes for durability and lasting color. The fact is that the best type of this cross will undoubtedly take its rightful place among the best of the reds after it has been officially tested. There is a distinct quality that differentiates it from the other leading reds such as *Mars*, *Gill's Crimson*, and *Earl of Athlone*. I do not mean to say that the color of this one is superior to these, but it is very good and other qualities will give it a high standing. There is quite a variation among the seedlings of this cross. Many of them do not measure up to the high standards I have mentioned, yet quite a few of them are very worthwhile indeed.

The seedlings from the *R. Mars-R. Griersonianum* cross produce reds that are beauties. This one had been named *Vulcan* in England. Among the seedlings the color ranges from a bright oriental to a dark red. However, the texture does not measure up to that of *C. P. Rafill* just described.

The foliage has a slight tendency to burn in the sun. The flowers have a tendency to smallness and are trumpet shaped. Hardiness has been very satisfactory so far. Despite some faults, this is a fine *Rhododendron*. The nice color of the best of the seedlings is the strong point of the cross. There is an aliveness to it that endears the plants to nearly all who see it. Some additional crossing might remedy some of the defects.

The cross *R. Griersonianum* and *Armistice Day* has produced some very nice seedlings for me. Here again the best of the lot produces flowers that are big. The color of the flower in the best of the plants is a very attractive shade of bright red. The plants flower when very young and they are satisfactorily hardy for us here. The best type of this cross is a good *Rhododendron*. When planted in the shade this one tends to rank growth and weak stems. Plenty of sunshine offsets this fault.

R. Griersonianum crossed with *G. A. Sims* gives seedlings with red flowers and the best are a very good red indeed. Some of the plants have fine, large trusses that make for attractiveness. The flowers are medium trumpets in all the seedlings. The color is clean, bright and clear in most of the plants raised from this cross. It is satisfactory for hardiness under our conditions. Let me say, however, that I do not intend for my observations about the hardiness of these plants to be accepted as conclusive. Several more years of testing will be necessary before a reliable hardiness rating can be given.

R. Griersonianum crossed with *Earl of Athlone* produces seedlings with flowers of a fine red color as might well be expected. The truss is somewhat rounded and formal like *Earl of Athlone*. Hardiness seems to be satis-

factory. The seedlings are all good growers and bloom when quite young. The best seedlings from the cross are fully as good as those I have mentioned so far from the other crosses. The best type from this cross is sure to be judged an outstanding variety. Color is the strong asset. Its flowers are really beautiful.

R. Griersonianum crossed with Lady Bessborough has given me some very interesting seedlings. I have two separate groups of these. One comes from seeds produced from the cross of *R. Griersonianum* with a pink variety of Lady Bessborough. The second group of seedlings are the result of *R. Griersonianum* crossed with a yellow variety of Lady Bessborough. The first cross mentioned has given seedlings with flowers that are a very soft, light red. This color is very intriguing. The flowers are trumpet shaped and have good size. This is the Daydream cross and the best type of my seedlings arouses enthusiasm wherever shown. The second cross gives seedlings with flowers that range from light cream to white. I was at first surprised to get white flowers from crossing a scarlet with a yellow. But *R. campylocarpum-clatum* is one of the parents of the yellow variety of *R. Lady Bessborough* and I understand it always produces a certain number of white flowered seedlings, whatever the cross.

Rhododendron, Diva is the result of crossing Ladybird with *R. Griersonianum*. The seedlings produce beautifully flowered plants. There is quite a range of quality in the seedlings from this cross. Most of them are good, a few are superior, but some have very little to commend them. The best type from the cross is creating a sensation in this section. It has nice big flowers that are a lovely soft pink. The truss is nicely arranged in a loose fashion and the flowers are long trumpets. Good

texture adds to the character of the flower and enhances the color. The hardiness and foliage of all the seedlings are very satisfactory.

R. Griersonianum \times *R. Loderi* — Corona produces some very fine seedlings. The flowers of the best plants are huge, being almost as large as those of *R. Loderi*. The color of the best type is a clear, soft, rose pink.

But the opposite of this cross, *R. Loderi* — Corona \times *R. Griersonianum* produces better seedlings yet. From the standpoint of flowers alone the best form from this cross is the best hybrid on my place. Some others will surpass it for all around performance, however, but it will be difficult to surpass the blossoms of this one. The color is a beautiful soft, salmon-pink. The flower is big and the truss is very large and is well arranged.

R. dicroanthum \times *R. Griersonianum* produces dwarfish plants. The seedlings all bloom profusely and they are quite hardy when established. Cuttings root very easily. The best type is admired by almost everyone. The color is orange and the flower is very attractive. It has a big truss with many flowers.

Before leaving the *R. Griersonianum* crosses I would like to mention two that have been named and standardized in England. Rhododendron Azor comes from crossing *R. Griersonianum* with *R. discolor*. This, in my opinion, is the best of the *R. Griersonianum* hybrids, from the standpoint of all around performance. The size of the flower is very satisfactory, though some in this class have larger ones. The truss arrangement is very pleasing. It is loose enough, and yet the individual flowers hold their places without flopping around as is the case with some of its cousins. The color of the best type of this one is difficult to surpass. It has an appealing softness and a perfect blending of two shades that can easily

get into difficulties with one another. The base color is rose pink and there is a suffusion of pale orange that gets deeper in the throat. *R. Griersonianum* \times *R. eriogynum* has produced Tally Ho. The best seedlings of this cross are very good indeed. The flowers are brilliant red in color. Some colors run to red-orange, but the best form of the lot is red. This one has fine foliage. A showy indumentum adds attractiveness. But Tally Ho is not dependable for hardiness without considerable care in our section. It will stand temperatures of ten degrees above zero if it is given a well protected location. For milder locations, it is a wonder.

To me an interesting group of seedlings comes from the cross, Moser's Maroon \times *R. eriogynum*. The best type of this one has been named Romany Chal in England. This Rhododendron is not to be confused with Romany Chai which comes from the cross, *R. Griersonianum* \times Moser's Maroon. Romany Chal has a many-flowered truss. Sometimes there are as many as twenty-four flowers in one truss. The color is a nice dark red. It blooms somewhat later than the *R. Griersonianum* hybrids. It is strong on hardiness and will probably stand zero temperatures.

Many other crosses could be described in detail, but space will not permit. The dwarfish, slow-growing *R. neriiflorum* hybrids are very interesting with their red, orange and yellow flowers according to variety. Some of these are tender and most of them are slow to flower.

Crosses that produce seedlings with sweet scented flowers are very attractive to people who value fragrance in their flowers. The cross *R. Loderi*-*Corona* \times *R. Fortunei rosea* gives plants that have both fragrance and other qualities as well. The flowers of the best type are very beautiful. They

range from snow white to shell pink and are frilled. The crosses *R. decorum* \times *R. discolor* and *R. Loderi* \times *R. discolor* both produce seedlings that have some fragrance.

I am very proud of the four plants of the species *R. lacteum* which are in my possession. This is a very slow-growing Rhododendron. My plants are six years old and are still only four to five inches tall. However, the tops were cut for scions one year. This one is especially fine for foliage. The leaves are large, round, dark green and glossy. My scions from this one were grafted onto good-sized plants of *R. ponticum* and they are growing much more rapidly than the parent plants. They will probably bloom in another couple of years or so.

R. lacteum \times *R. Loderi* is a cross that has produced no yellow flowers in my seedlings so far, but some seedlings have yet to bloom. In the best type the buds are sulphur yellow, but the open flower fades to white.

The fine character of *R. lacteum* shows good results when it is crossed with the yellow hybrid, Mary Swaythling. All of the seedlings from this cross have proved to be good, but some are what I would call sensational. All are characterized by compact, stocky growth and large, attractive foliage. They are medium slow growers. Some few of the seedlings in the group have white flowers, and most of them are pinkish with a trace of apricot in color. A few of the seedlings are yellow flowered. The best type that resulted from this cross for me is a yellow and it is a real standout. Its flowers are almost twice the size of those of any other seedling in the group. The color of this one is highly interesting. The buds come out red, and the flowers open to a primrose yellow. This makes a very fine and unusual color pattern when the plant be-

gins to flower. The large, glossy, dark green foliage rounds out a beautiful picture. This one will surely prove to be one of the largest flowered yellow Rhododendrons in existence. It is well to say in passing that I have found the *R. lacteum* hybrids will do better when planted in shady places.

I have enjoyed very much my work with *R. auriculatum*. This one is a slow bloomer, but is a fast grower. It blooms in late July or early August here and all of its hybrids are late season bloomers. I have already mentioned the fact that scions of *R. lacteum* grafted on sturdy *R. ponticum* understock show marked acceleration in both growth and flowering habits. I have had still more spectacular results with scions of *R. auriculatum* that were grafted on *R. ponticum*. Such plants have set buds the second year and have produced very satisfactory flower trusses the third year. Another example is that of *R. didymum* scions grafted on *R. ponticum*. *R. didymum* is usually a slow bloomer, but these plants have flowered for me the second year from grafts.

R. Ungernii \times *R. auriculatum* is a good cross and has produced some nice seedlings for me. The best one of the lot has pale pink buds and flowers that are white and slightly frilled.

Another good cross is *R. Loderi* \times *R. auriculatum*. Seedlings from this cross make nice plants. They are not quite so rangy as *R. Loderi*. The foliage of all of them is nice sized. The plants are fast growers. My best of the lot has pale pink buds, and white flowers that are fragrant, and slightly frilled. The best from this cross in England has been named *R. Lodauric*.

R. Griersonianum—*R. neriiflorum* \times *R. discolor* has proved to be very interesting cross for me. The seedlings have divided themselves pretty evenly into three color classes. About one

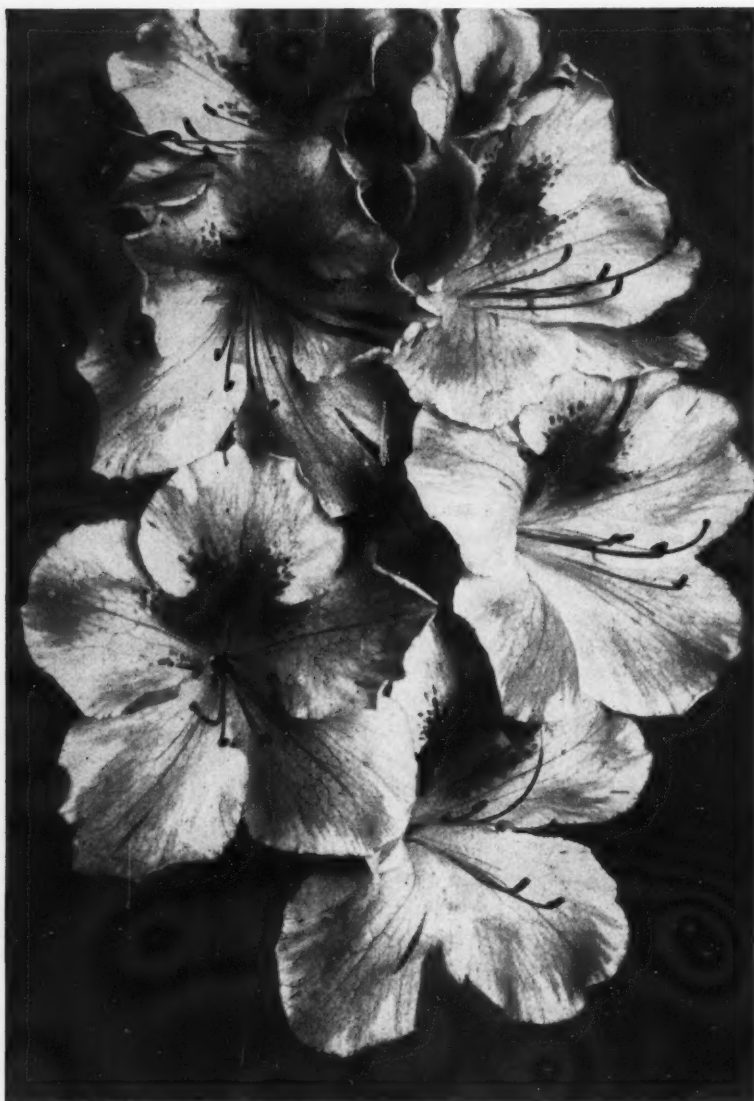
third have been red, another third have been pale pink, and the final third have proved to be in the orange to yellow class. Here is a cross where selections of the best types will have to be made from at least two of these color groups.

I would like to explain in closing that in describing the various crosses, the seed bearing or mother plant, has been mentioned first in each case. The variety from which the pollen was taken is mentioned last. This is a very good rule for anyone to follow who is doing hybridizing. It should also be noticed that the cross mark is used only for the last cross performed. A dash mark is used to denote former generations. For instance: *R. Gauntlette*—*R. Aucklandia*—*R. campylocarpum* \times *R. campylocarpum*. In this case *R. campylocarpum* furnished the pollen for the cross. Another example: *R. dicroanthum*—*R. Griersonianum* \times *R. strigillosum*—*R. Thompsonii* explains the cross just as well as: (*R. dicroanthum* \times *R. Griersonianum*) \times (*R. strigillosum* \times *R. Thompsonii*).

HALFDAN LEM,
Seattle, Wash.

Two supposedly tender azaleas.

In the work with studying the old "Indian Azaleas" grown out of doors in the South, the editor of the magazine has brought together a fair collection of varieties purchased from various sources in the South. His interest has aroused the usual local reactions and he has already discovered that some of the plants supposedly tender are not so tender after all. Some of them have already been reported in the magazine, but in this issue, there is a picture from Lady Cavendish or Cavendishii, which has been growing out of doors in Dr. Weiss's garden here for over ten years. The photograph is natural size and the twig shown gives a



Robert L. Taylor

Azalea, Lady Cavendish

good idea of the floriferousness of the plant.

In habit, the bush suggests the growth of *Rhododendron indicum*

known usually in the forms sold in nurseries as *Azalea macrantha*, but it is somewhat modified and with rather less pointed leaves than that species. Like



Robert L. Taylor

Azalea, Gunbi

R. indicum, it is late flowering. The present photograph was taken on May 10, 1946. The color is a tender rose, washed over white which shows irregu-

larly on the margins. There are occasional flakes of deep rose and a beautiful rosy crimson blotch on the upper lobes. This is a color pattern that is

not uncommon in the "Indian azaleas" and which is closely matched in the plant known as Criterion, but Criterion blooms here some weeks earlier. It is not a color pattern however, that is very common in the hardy forms or those which are already known as hardy here.

Among the Japanese hybrids which have become known hereabouts as Chugai hybrids, a name for which there is no reason other than that the plants were brought from the Chugai nursery years ago, is the form illustrated, Gumbi, described in the catalogue as "Light cherry pink with salmon red variegation, fringed petals, large flower." The color here is really what I should call a tinted white, the color perhaps of the Yoshino cherry when fully opened; the stripes are pale rose and, with me, not very numerous. The photograph was taken on June 12, 1946.

During the early years when the plants were first imported they were kept under cover. Some of the first propagations that were put out were not very large and the bark split, killing the small plants outright or reducing them to the necessity of making a new plant from the base. Later plantings were of larger plants with a better

main stem that was really "hard." No trouble has followed and each year the plants have grown larger and have flowered more abundantly. The growth is inclined to be spreading and in the late summer there is an abundant lateral growth of new shoots that recall the habit of Gumpo which is better known in many places.

In our climate, where summer rains are not guaranteed at regular intervals, the flowers are not as large outside as when grown under glass where the watering can be controlled. Possibly in a moister climate, the flower sizes would be as large as those of blooms under glass or in Japan.

It is to be hoped that some day we shall have a better understanding of what material is covered by the species *R. eriocarpum* as originally described in Japan, and it is the writer's feeling that we will find that it comes much closer to *R. indicum* than to *R. Simsii* to which Wilson assigned it. Whether or not we shall ever be able to disentangle the parentage of the many Japanese hybrids in which *indicum*, *eriocarpum* and *Simsii*, this latter in its garden forms and not in the true species form, have combined, is problematical. Parallel crossing may give the clews.

Narcissus Notes

B. Y. MORRISON, *Editor*

More and Better Daffodils

One of the great pleasures in flower growing is sharing your interest with others and of being able to make dozens of flowers appear where none grew before. The daffodil is a splendid flower for this purpose because, as a rule, it increases quite rapidly and one is soon able to put out lines in many directions. It is surprising how effective

this method can be. Several years ago I gave a few really nice varieties to a garden club member whom I had never known before. Last year she began importing for herself, and she will probably gather around her others who will do the same. In this way it is possible soon to have enough varieties to put on quite a nice show.

In Huntington, W. Va., the daffodil

show is now a regular event. Last year it was given in the large assembly room of the Woman's Club. I will have to say that the best space was given over to Flower Arrangements which seem to be making such inroads all over the country. Unless we are careful this activity is going to crowd the Flower Growers off the map.

It is always interesting to see what flowers receive the most attention. After all the "majority party" is entitled to some consideration. Color and size usually attract the favor of the many, so for these Lady Kesteven drew the crowd. It is really an astonishing combination of color, the perianth being purest white and the cup a vivid cherry-red. It is primarily a cut flower as exposure to bright sunshine will soon destroy the color of the cup. But in this it has plenty of company for our hot sun is fatal to many of the red cups. I try to plant them where the sun does not hit them for several hours in the morning, which gives one a chance to see them at their very best. Or they can be cut the day before they are ready to bloom and opened in the house.

Forfar and Red Abbot also produced some fine red-and-white flowers. Aleppo has a brilliant red edge to the cup, and like the others it is a vigorous grower. Among the red-and-yellows my best flowers were Carbineer, Rustom Pasha, Diolite, Marksman (which stands up and lasts so well in the garden) and Market Merry. Seraglio was quite attractive. These are not new flowers but often they give good account of themselves even with later introductions. Coverack Perfection, Bodilly, Polindra, Pilgrimage and St. Egwin made a good showing.

The Leedsii is growing in favor so that such varieties as Mitylene, Stateliness, Pinkeen, White Sentinel and others have many admirers. I have always

liked the small jonquils and hybrids like Polnesk and Trevithian produce quantities of flowers and increase rapidly. They make a nice border for a walk. Lanarth has a rich old golden orange cup. Helsa and Truan I have not seen but they sound interesting. Cherie, imported last year, gave two nice flowers and showed a slight shell-pink in the cup. White Wedgwood has the most delightful fragrance of any daffodil I know, although this is never mentioned. After the first rush of bloom is over these jonquil hybrids seem to send up a few late flowers which are always welcome.

Many of the late flowers never get to the shows but they include some of the most beautiful. After one has learned that size isn't everything, nor bright colors the last word, there are still many things to be admired. It would be hard to imagine a collection of daffodils without Samaria and Silver Salver, while Mr. Wilson's Cushendall, one is tempted to say, is the most beautiful of all. When mine are in bloom I make many trips a day to the garden to admire their lovely quality, glistening white perianth and shallow crown with its vivid moss green center. Of its type it probably has no rival in the daffodil world. Addio is another small crowned Leedsii which is among the latest and bids us goodbye till another year.

There are also some late poets to finish up the season. Hexameter has a round, flat snowy white perianth of splendid substance and a red edged citron eye. It is very tall and one wishes for enough to border a walk. Cantabile has a lovely green eye edged with dark red. It must be cut early to save its beautiful color. And last, Lights Out, with its fine orange scarlet eye and most appropriate name.

The war and other calamities put an end to my importing for some time, but



This is not an "exhibition" flower



A good "exhibition" type

in 1945 a few bulbs were ordered. Incidentally, what a wonderful place Ireland must be for raising daffodils; one seldom sees such splendid bulbs. The next spring was eagerly awaited and in this case there was ample reward, despite the "cooking" by the Dept. of Agriculture. When the buds were about to burst the bed was widely covered with light excelsior carefully tucked around the plants to protect them from the splashes of mud that a windy rain storm can produce so quickly with such disastrous results. This was an untried experiment but I think it was quite successful, as it also kept the stems from being whipped around in the wind. The excelsior was carefully removed as soon as it was no longer needed, and I could see no harm resulting. Anyone who spends years poring over catalogues knows how difficult it is to select flowers, sight unseen, which makes one all the more eager to see how well one has chosen. Red Hackle which produced four flowers was accepted as a very fine addition to the few good red-and-white incomparables. It has a good stem and neck. The slightly reflexing perianth sets it apart from the general run of flowers. As my only pink daffodil is Mrs. Backhouse, I was charmed with Rose of Tralee. It was a most delightful color. Perhaps the season was just right, and it pleased me enough to order another, so as to have plenty with several shows in mind. Sylvia O'Neill was also viewed with real pleasure. It is one of the newer flat crowned Leedsiiis which Mr. Guy L. Wilson has produced, and a sister seedling to the much coveted Chinese White. It is a large flower, pure white except for an edge of lemon on the cup. Most Leedsiiis of this type have been small flowers, so these are a new departure. White Butterfly, described as a pure white Folly, has a faint glow of green

at the base of the crown. This bit of color gives a finishing touch to a number of daffodils. Grayling, which I have had some time, also shows this lovely shading. Alberni Beauty was selected partly for its very late blooming. It is another flat crowned Leedsii, also with green at the base of its cup. The stem is tall and the plant looks vigorous. I liked it well enough to order more.

Jean Hood is a very early red-and-white Incomparabilis with a tall stem and sturdy appearance. Brunswick, an early Leedsii, is extremely lasting, in addition to possessing most of the qualities which go to make up a really beautiful flower. Lastly Porthilly produced some brilliant yellow-and-red flowers. Taken all together one could feel this collection of varieties, new to my garden, would give pleasure year after year to all beholders and in the course of time some would probably journey off to found new centers for daffodil admirers.

As a last word, may I make a plea for help from the Daffodil growers who have had the opportunity to go abroad to the great London shows and to visit the leading hybridists? They could do so much for the rest of us if they would take a little time to tell what they have seen and suggest varieties which seemed outstanding. There are a lot of shows given in this country but does any one give any reports? Hardly ever.

MRS. H. A. BARBEE,
Point Pleasant, W. Va.

Growing daffodils in pots.

As soon as I have time, after the narcissus bulbs arrive in the autumn, I plant them in soil in bulb pots or flat pans. I never treat them in any special way. For the soil mixture I use one-third sand and the balance good black loam. If I happen to have some old

manure I powder it and mix a handful in the mixture for each pot. The pots are then carried to the special room that we have made under the sun porch.

The sun porch is glassed in. The walls that support it are of cement blocks into which we have put three windows and a door that leads into the basement. In this room I have a large wooden box which is faced with a heavy curtain and into it, go the bulb pots. I use this also for the forcing of hyacinths and the commonly grown narcissus such as Paper White, Soleil D'Or and the Chinese Sacred Lily. These I also plant in soil but they are not left so long before bringing to the house, just long enough for a good start on the leaves.

I watch the soil in the pots carefully and keep it moist at all times but not wet. The narcissus are usually all planted by October 20. If the noses begin to show before Christmas, I put a tin can with holes in it over them and the noses don't grow so fast!

Since the house is always filled with family and kin for the Christmas Season, I usually do not want to bring up the bulbs before that time, but soon after Christmas they are brought up, kept on the floor of the sun porch for about a week and then brought in to the windows. At first I bring up only King Alfred, then Empress or Sir Watkin, next Diana Kasner and last of all Laurens Koster. But this does not mean that Laurens Koster wouldn't bloom just as well if he were brought up first. It is just the way in which I handle them.

In the autumn of 1944, I decided to try a few of the newer varieties, Moonshine, Lovenest, Thalia, Mrs. E. H. Krelage, Silver Chimes. After flowering in the house, they were planted out of doors. This year (1946) many new sorts but they were planted outside

without a trial indoors. They included, Beesheba, Diotima, Silver Star, Orange Cup, February Gold and Golden Sceptre.

During some of the recent years I have dug up some of my own bulbs to force inside and find they do well and can then go back once more into the garden. It has been a real pleasure and they have given me no end of successes.

As there is no gas in the house, I do not have to have any concern as to whether or not that will have any harmful effect. Certainly the practice of forcing bulbs in the house, in this simple way could be followed by others with as much pleasure.

MRS. E. A. BLANCHARD,
Omaha, Nebr.

Exhibition flowers.

In the time of daffodil shows, there are always heartburnings after the judges have finished their work, but the level of material presented in shows is constantly rising and it is the exception now to find a poorly grown specimen or one that is not in "good condition."

One thing still continues, and that is the exhibition of flowers which are not of exhibition quality. This is somewhat difficult to define and at times somewhat difficult to defend.

It is easy to consider it, perhaps, if one will remember that a show or exhibition is a perfectly artificial thing with rules that are arbitrary. They are merely the rules of the game as decided in advance by those who are supposed to know.

To illustrate this one point two pictures are presented this time to illustrate this one point. As a matter of fact, the variety, show to illustrate the not-exhibition flower, is a much better garden plant than the other. Stresa, is

the one that should not be entered in the show, Tain the variety that is about perfect in form and poise, as well as quality. Stresa has charm, a lovely texture, good color, nice substance and a reasonably good stem; it does not have good carriage and it has also a weak neck and an irregular perianth. Tain, on the other hand, has all the points in favor, plus a perfect carriage, and exquisite form.

Some may argue that good garden performance is more important to the

amateur than anything else. If that is the case, fine, but it does not mean that because a flower grows well, that that is enough to make one show it in a class where other points are required. Remember, it is all arbitrary! Eventually one learns to enjoy the informal flower in the garden or the house and to take only the show flowers to the show table. Perhaps in time we may have what sometimes happens in large cities, a "mutt show." Then one can take anything!

A Book or Two

Insect Pests of Azaleas and Camellias and Their Control. L. L. English and G. F. Turnipseed. Agr. Exp. Station of the Alabama Polytechnic Institute, M. J. Funchess, Director, Auburn, Ala. Circular 84. April, 1944.

A useful illustrated bulletin that touches on the more important troubles in the two fields.

Grassland Husbandry. H. I. Moore, George Allen and Unwin, Ltd.; W. W. Norton and Co., Inc., N. Y. C. Distributors. 112 pages. Illustrated.

Although this is a British book it is well worth more than a passing look, no matter how its data need to be translated for use here. The problems treated have to do with the concentrated attention expended by the British during and after the recent war, when grasslands were reduced in area for food production and must now be restored in part, with a better understanding of their proper make-up and maintenance.

Grow Your Own Vegetables. Paul W. Dempsey. Houghton Mifflin Co., Boston. Revised Edition, 1944. 220 pages, illustrated. \$2.50.

Of all the books that exhort to vegetable production and which range from almost emotional appeal to encyclopedic completeness, this would fall nearer the beginning of the range. There is no "gush," however, and there are plenty of facts presented without dullness.

Plant Growth. L. Edwin Yocum. The Jacques Cattell Press, Lancaster, Pa., 1945. 203 pages, illustrated. \$3.00.

This is another book, born of the war era, but with a rather different intent from that of most.

In Chapter I, "Introduction," the most significant paragraph is perhaps: "The many questions of friends concerning their growing plants stimulated the author to select what seems to be the fundamental knowledge necessary for solving their problems. These peo-

ple are already growing plants successfully but they are interested in the requirements of plants and the best cultural methods of meeting them . . ."

The author apparently has a catholic host of friends most of whom apparently had read very little in this field and for whom Dr. Yocum has prepared a gentle and not too provocative text.

Handbook of the Trees of the Northern States and Canada. Romeyn B. Hough. The Macmillan Company, New York, 1947. 470 pages, illustrated. \$5.50.

This is a reprint of this valuable work which shows photographs of trunk, branch, leaves, fruits and wood section of the trees illustrated as well as distribution maps and a text to supply the details, not obvious in the pictures. The publishers feel that it will be useful to "lumbermen, students and botanists as well as the ordinary layman." As ordinary laymen we protest the sequence but we recommend it to our other lay friends for use, winter or summer, since there are winter twig pictures in most cases, a feature that was omitted in the enumeration above.

Excepting on those relatively few pages devoted to keys for the identification of species, there are pictures on every page, so that the "most lay" of laymen will have no excuse for not reading it.

Buy it for your library now.

Around the Garden. Dorothy H. Jenkins. M. Barrows and Company, Inc., New York, 1947. 206 pages, illustrated with rather decorative line drawings. \$2.50.

This is a month by month "what-to-do" book. Much of it has appeared in Miss Jenkins' Garden Page in the *New*

York Times and will be recalled by her many readers.

It is really more than a month-by-month book for it is also a week-by-week book with one eye on the past and one eye on the future as well. Even if this may sound like some sort of acrobatics, which gardening itself often becomes, the book itself is nice smooth reading even if one has not the faintest intention of doing anything that the author suggests, nor even make the slightest effort to interpret her very sound advice to suit his own scheme. There are no lists of recommended varieties, thank Heaven, but the text is enlivened at times by the definite expression of the author's liking for a specific kind, not always of the latest "gold medal" award, again thank Heaven. There is no "gush" and at times there is a very discreet touch of sly humor, so that one could wish that the author had "ribbed us" a little, say for example on the page that deals with Flower Shows in March, one of the most dreadful influences in all American Horticulture!

Fifty Tropical Fruits of Nassau. Kendall and Julia Morgan. Text House, Coral Gables, Fla. 1946. 114 pages and index. Illustrated. \$3.50.

This is a beautiful book that should be of as much interest to persons living in Florida as those of Nassau, for the fruits are by no means peculiar to that region, most of them being introduced into cultivation. The photographs are a delight.

Camellia Growing. R. J. Wilmot. Bulletin 130, University of Florida Extension Service. 1944. 19 pages and cover. Illustrated.

This is a model small leaflet which tells all that is basic in the matter in hand and should be read by all beginners.

Cacti and Succulents

W. TAYLOR MARSHALL, *Editor*
Director, Desert Botanical Garden, Phoenix, Arizona

Henry Shaw's Garden

When Henry Shaw died in 1889 he left to the people of St. Louis and garden lovers all over the country, a well-established botanical garden that was destined to become even more prominent than it had been during his lifetime. The Missouri Botanical Garden had its beginning in the era preceding the Civil War, for we know definitely that it was open to the public about 1860. Eleven years earlier he had built his country residence on his estate, Tower Grove, located on the outskirts of St. Louis and no doubt when the building went up he also made preparations for a garden to be laid out shortly after. The garden virtually remained a private garden up to his death but it was always open to the public except on certain occasions.

Mr. Shaw was influenced by such notable men of the botanical world as Dr. George Engelmann, Dr. Asa Gray and Sir Joseph Hooker; and in a measure they were the ones who induced him to establish an institution more on scientific lines than merely on conventional esthetic. In 1885 Henry Shaw invited Prof. William Trelease to come to St. Louis and help him realize his dream of a botanical garden.

Our story concerns the Garden's collection of cacti and succulents. We know that these plants played an important role even during Henry Shaw's lifetime. After Engelmann's death in 1884 most of his collection was removed to Shaw's garden along with his herbarium. Dr. Engelmann was the foremost cactologist of his day. To him was entrusted the naming of many new species emanating from that re-

gion to the great Southwest which came into our possession after the Mexican War. He also made the acquaintance of many collectors, botanists and explorers who kept on sending him living material for study. In this way he acquired a collection of desert rarities the like of which was unknown in this country. It can be safely ventured that Engelmann had one of the first and most important cactus collections in the United States. The center of cactus knowledge was located in St. Louis; it had its beginning there and then it spread out to other cities until today cactus collections and cactus enthusiasts are located in every metropolis of the Union and hardly a hamlet is without a representative.

As is to be expected none of the material of Engelmann's is living today, but his herbarium (dried specimens) is deposited at the Garden and is available to research workers.

It is difficult to surmise just what kind and how many succulents were grown during Shaw's days as there was no attempt made, as far as we know, to keep a record or catalogue of these plants. However, when Trelease made his first report as Director in 1890, he wrote that the succulent collection was considerable and received constant additions. At least 65 species or varieties of Agave were mentioned on the administrator's inventory list. Five years later (1895), well over 500 species of succulents were in cultivation, of which more than half were true cacti and nearly a hundred were Agaves. The latter were chief pets of Dr. Trelease, who devoted considerable study to them and became the out-

*Ladislaus Cutak*

South African Room, Missouri Botanical Garden

standing authority on this Amaryllidaceous group.

In the early days all the cacti and rest of the succulents were placed outdoors in beds and rockeries, where they made considerable show during the spring, summer and early fall months. The method of exhibiting cacti in outdoor beds was highly advantageous for the plants as they grew in vigor and size due to abundance of sunshine, occasional showers and invigorating air. This method had its drawbacks also. The plants put on such marvelous growth during the active season that

they became extremely difficult to handle when time for them had come to be brought indoors. Thus in 1915, two years after the present imposing conservatories were completed, one of the rooms was planted out permanently with desert plants.

The original greenhouses stood on the site of the present Rose garden and during those first years the cacti were exhibited in outdoor beds just east of the Linnean House. Against the red brick wall were grouped many of the tall *Opuntias*, torch cacti, night bloomers and tree-like *Yuccas*. Across

the walk were beds containing all the smaller kinds like *Mammillarias* or pincushion cacti, sea urchins and golden balls while adjoining rockeries featured exotic sedums, *echeverias* and kindred plants. There were long beds of Century plants just west of the old Agave house. Toward the main entrance were additional beds with Prickly Pears, wicked chollas, yuccas and miscellaneous succulents. Most of the plants were in pots plunged in the ground and could be removed more easily into their winter quarters when frost threatened in the fall. Later, when a large supply of pincushions was on hand, these globose cacti were used in geometric designs to form shields, stars and other intricate patterns.

The old greenhouses were small structures as compared with those standing now. The old Cactus house was at most only about 12 feet high at the gable ends and the Yucca dome was somewhat higher. When the present more imposing Conservatories were completed in 1913, its main room — devoted to palms and jungle exotics — was made to measure 90 by 110 feet and 65 feet in height. The main room is flanked on the north and south by the Economic and Cycad houses, both being 45 by 95 feet and 50 feet in height. Two long wings extend westward from these rooms and the wing rooms now serve as desert houses, each measuring 33 by 145 feet and 40 feet high. The north wing houses Old World succulents while the south wing features xerophytes from the Western Hemisphere. Up to 1934 only the south wing was devoted to succulents but as the collection increased additional space was needed and it was decided to utilize the north wing for this purpose.

Many people have contributed towards the success of the Garden's collection of succulents. The earliest rec-

ord of cactus donations is that of Monsieur Blanc of Paris, France, who shipped thirty *Echinocereus* and an equal number of *Mammillarias* on February 2, 1890. Since then a steady flow of plants has been coming in, either through purchase, exchange or gift and many notable collectors are entered on our accession books. There was a lull during 1913-1926 when very few desert plants were acquired; but when the devastating hailstorm of 1927 nearly wrecked the collection fresh attempts were again made to rebuild it. There are a number of old plants still growing which have been in the collection for about 50 years but the vast majority date after the catastrophic 1927 storm.

When the writer assumed charge of the succulents in 1930 he first made an inventory of all the plants in the Main Conservatories and found to his dismay that the succulent collection had dwindled down considerably as an aftermath of the storm. An exchange was soon established with well known collectors, dealers and institutions. Many of the plants now growing have been raised from seed by the writer and have made appreciable growth during the last 10 or 15 years. Considerable changes have been wrought in the two desert houses. As the plants grew to immense proportions, duplicates were removed and other species took their place. Specimens were transferred to advantageous positions. An attempt at landscaping was made by planting of desert shrubs to simulate desert regions and in a measure this has proven successful even though greenhouse conditions limit the scope of such projects.

At the present time the Cactus house is being remodeled and improvements are going on in the South African room. The former will be practically torn up and more xerophytic bromels will be added. These plants are destined



Ladislav Cutak

The Cactus House, Missouri Botanical Garden

to become better known as horticultural subjects and the Garden will play a major role in bringing them to the attention of garden-minded souls. The Euphorbias which played such a prominent part in the Cactus house have now being removed to their permanent positions in the South African room. With due modesty it can truly be said that the Missouri Botanical Garden possesses one of the most representative succulent plant collections under glass in America. Aside from this fact there is another reason why the cactus enthusiast will be drawn to this Midwest institution and that is because it is the cradle of many cactus traditions in America.

LADISLAUS CUTAK.

Winter Flowers

My summer visit to "My stay-at-home friends" as reported in the October issue, so weakened my resistance that I accepted with alacrity an offer to become Director of the Desert Botanical Garden in Arizona, where I might live in the midst of those friends and many other of their South American, African and Asiatic relatives.

Although I arrived at the Garden on December first and expected no flowers before spring, I was delighted to find many of the plants in full bloom. Winter in the Salt River Valley of Arizona is not the harsh season of our eastern and northern states, the sun shines nearly every day and the afternoons are warm with cool evenings with occasional frosts and on one night the temperature dropped to 28° above zero. Throughout the month and even now, in the middle of January, *Nicotiana glauca* Graham, the tree tobacco, has been in flower. The tubular flowers are greenish-yellow to contrast with the glaucous leaves. In addition to its ornamental value this tree is the source of the alkaloid, anabesine, which

is more efficient than nicotine in killing certain aphids.

A seedling of *Cephalocereus senilis* (Haworth) Pfeiffer which was three feet in height in 1940 is now about nine feet tall and it also produced flowers in early December. Known as the "old man of the desert" because of the long, white, hair-like spines that clothe the stems it has become the prime favorite with collectors but it is seldom seen in flower and the rather small flower is odd rather than handsome.

Lemaireocereus Hollianus (Weber) B. & R. and *Lemaireocereus Beneckii* (Ehrenb.) have both produced their interesting flowers profusely during the month and numerous plants of *Lemaireocereus pruinosus* (Otto) B. & R. have borne eight to ten flowers atop each branch. All of these are dark, brownish red in bud but the inner petals are white.

In addition to the flowers the garden is brightened by the numerous large, egg-shaped fruit on the many large plants of species of the genus *Cereus*. These are edible fruits but the birds eat them as fast as they ripen. The birds do not eat the fruits of *Opuntia Dillonii*, which are of even better flavor than the *Cereus* fruits, so we have gathered a large crop of them and made them into a jelly of rich red color and very good flavor. *Opuntia Dillonii* is a native of the West Indies, where it often grows just above high tide line along the sea-shore so I was surprised to see how beautifully it could grow in our dry desert air and how profusely it fruited here.

Now, in mid-January, the South African Aloes are all coming into flower. As there are more than forty species of the Aloes in the garden and hundreds of plants of most of the species, the massed color effect of the flowers is most striking. From the lemon-yellow of the flowers of *Aloe vera* to



Rush

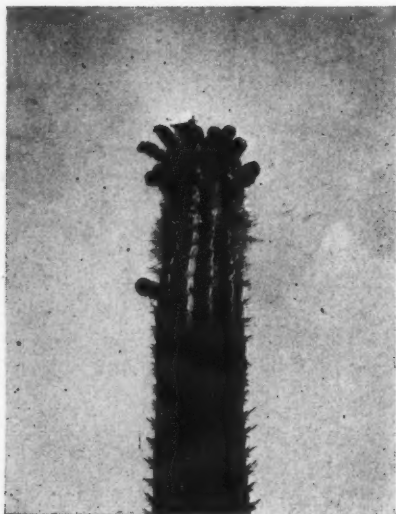
Lemaireocereus Hollianus; *L. Beneckii*

the deep reds of the flowers of *Aloe ferox*, all intermediate shades can be seen.

The deep red of the weeping flowers of *Bryophyllum tubiflorum* Harv. and the light lavender flowers of *Bryophyllum Daigremontianum* Hamet are to be observed in patches of color throughout the plantings where they have established colonies of several hundred plants to a group. As each leaf of these bryophyllums bears numerous adventitious plantlets, all of which fall to the ground and take root to form new plants they would doubtless take over the entire garden if not controlled.

Another plant to flower in mid winter was *Pachycereus pecten-aboriginum*

(Engel.) B. & R. a species of giant cactus native to Baja California and Sonora, Mexico. Although I have seen many thousand of these giants in their habitat the only flowers I have observed were borne thirty feet or more above the ground, too high for close observation. In the garden the flowers appeared on plants grown from small cuttings which are now seven and nine feet high so the flowers are in easy view. The buds are covered with bright red scales, at first unarmed, but as they lengthen a collar of brownish wool with intermingled strong, bristly spines appear. By the time the flower opens it has lengthened to about three inches. The inner petals are white and fleshy and the flower has numerous stamens



Rush

Pachycereus pectin-aborignum

and one rather heavy style which bears 10 long lobes.

The fruit is covered with yellow wool and long yellow bristles, somewhat resembling a chestnut and was used as a comb by the Indians, hence the plant's Latin name.

W. TAYLOR MARSHALL.

The Mistletoe Cactus, Rhipsalis

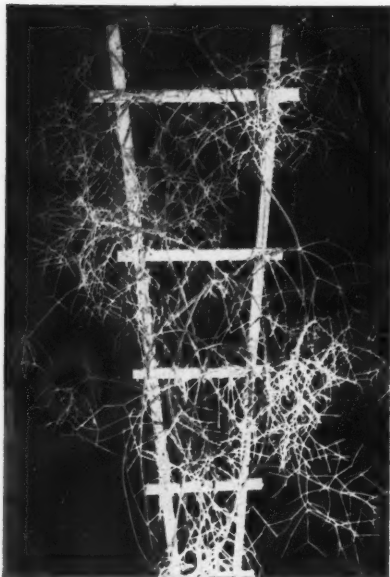
This group of cactus plants comprise the largest genus of the sub-tribe Rhipsalidanae and is made up of about sixty species, some of which are quite common in our gardens. The plants are very much admired and sought after by succulent collectors and by flower lovers generally, who are intrigued by their unusual forms and growth habits.

The name *Rhipsalis* is derived from the Greek, meaning wicker-work, referring to the slender, pliable branches of the typical species. The common name, mistletoe cactus refers to the

growth habit of the species which are found in clusters on trees in tropical forests where they resemble clumps of mistletoe from a distance.

The branches are variable in habit, the variations paralleling those in the *Opuntias* in that the stems are many jointed and vary from teret to flattened. The flowers of all species are similar, with few, sometimes only 5, distinct petals which open wide displaying a few slender filaments borne on the outer margin of the disk in one or two rows; the single style is erect and capped by 3 or more, slender, spreading stigma-lobes. Flower color is white, cream or pinkish.

The fruits are round or oblong, white, pink or red juicy berries, abundantly borne and very colorful, lending attraction to the plants long after flowering periods.



Rush

Rhipsalis teres (Vellozo) Steudel,
a native of Brazil

The plants are all epiphytic and, in nature, hang from trees, the branches sometimes erect, sometimes pendant. They produce aerial roots which help to anchor the plant to the host tree and assist in assimilating food. While these plants are normally tree dwellers they occasionally fall or are knocked out of their chosen home by animals or birds, and when this happens, they seem to be quite able to take root where they land and continue to grow there.

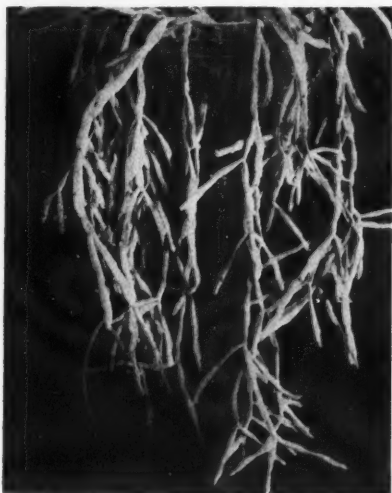
Rhipsalis are well adapted to hanging pot culture, the main requirements are, some shade, plenty of leaf-mold in the potting soil and an exceptional amount of water at most times. Temperature should not be allowed to go below 40 degrees. Almost any type of fertilizers are acceptable but I prefer the old reliable barnyard type for them and have had fine results from its use.

Glass house protection is essential in colder districts or the plants can be successfully wintered indoors if hung in a light, warm window and kept



Rush

Rhipsalis rhombea (Salm-Dyck)
Pfeiffer, Brazil



Rush

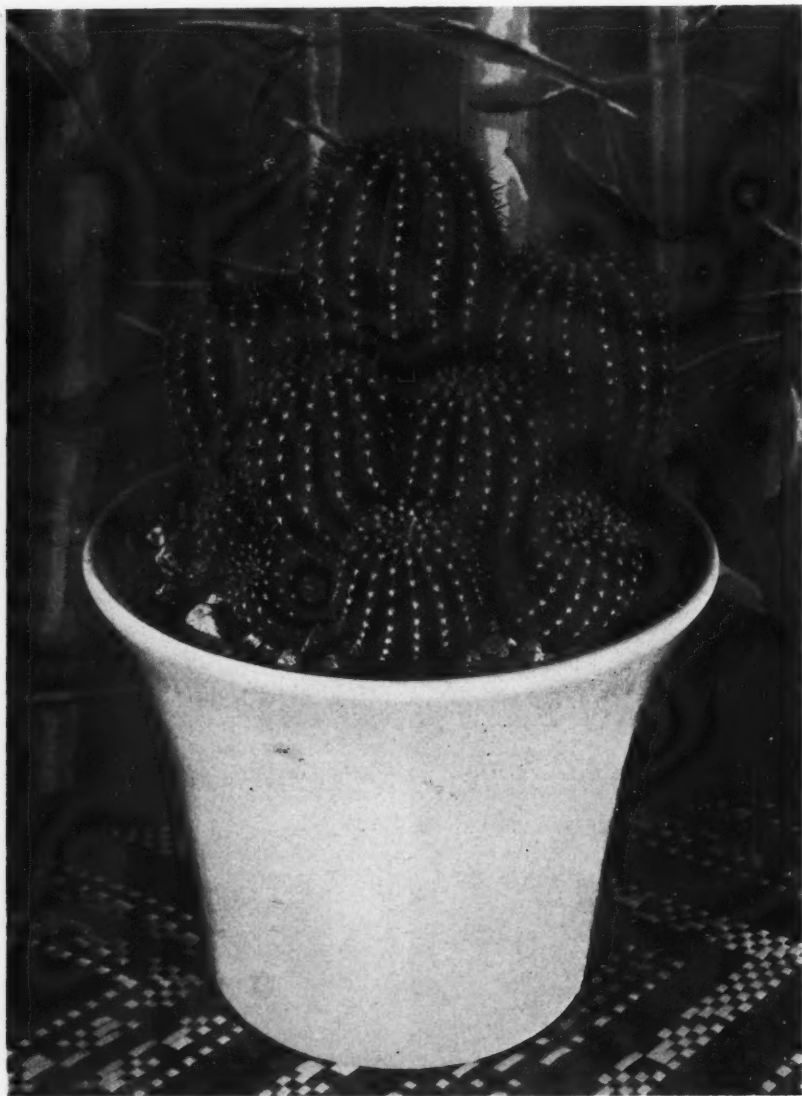
Rhipsalis trigona Pfeiffer,
also from Brazil

moist. For summer a lath house can be used or the potted plant can be hung in the shade of a not too heavily leafed tree.

To more easily understand these delightful plants we may divide them into four groups based largely on the shape of the stems.

Group 1. Six species with many short, thin, round stems suggesting grains of rice strung together, the stems forming large clusters. Best known is *Rhipsalis cereuscula* Haworth, called the Rice cactus, a very interesting and pretty plant. The other species are: *Rhipsalis cribrata* Rumpel, *R. prismatica* Rumpel, *R. heteroclada* Br. & Rose, *R. clavata* Weber and *R. mesembryanthemoides* Haworth.

Group 2. Plants with thin, long, pendant stems which sometimes reach a length of three or more feet. These long stems when closely covered with

*Graham Heid**Trichocereus Spachianus*

[See page 133]

the round, white fruits are responsible for the common name Popcorn cactus which is applied to *Rhipsalis cassutha* Gaertner and possibly other of the species. The stems seldom grow thicker than an ordinary lead pencil. About 26 species are included.

Group 3. Plants with angled or ribbed joints or sometimes winged. *Rhipsalis pentaptera* Preiffer, frequent in collections, illustrates the ribbed species as does *R. Tonduzii*. *Rhipsalis Warmingiana* Schumann and *R. gonocarpa* Weber are angled or winged species. *R. paradoxa* Salm-Dyck is well known as the Chain cactus because its branches grow in short, 3-angled sections, each set at right angles to the section before it. The recently described *R. epiphylloides* Campos-Porto and Werdermann has branches composed of short sections shaped like those of the Christmas cactus.

Group 4. Plants with flattened, thin, broad, leaf-like stems. *Rhipsalis crispimarginata* Loefgren with pale green stems with wavy edges has long been a favorite of mine. *R. crispata* (Haworth) Pfeiffer is another fine plant which flowers so heavily that, when in full bloom, it makes a veritable bouquet. *R. rhombosa* Pfeiffer, its stems always broad and thin, colors to a red or dark purple and is also a very free bloomer.

To anyone becoming interested in these plants I can promise a wealth of beauty and infinite variety. They repay for their study with a great deal of enjoyment.

H. G. RUSH.

Decorative Cacti.

Few of the Cacti produce flowers of more breath-taking quality than do the *Trichocerei* from South America but as most of the species become large plants before the flowers are produced

they are seen only by the favored few who live in districts where they can be grown out of doors or who have hot-houses.

Fortunately, many of them are attractive in the symmetry of their form, even when not in flower, and they can be grown with great satisfaction as indoor plants.

For this purpose select a glazed pot of color contrasting to the body of the plant. In the bottom of the pot place an inch of pebbles or pot-sherds to permit of perfect drainage as all of the Cacti are intolerant of water at their roots. Above this use a soil that is very loose, consisting of equal parts of sharp sand, top soil and leaf-mold.

A topping of colorful pebbles added after your plant is potted completes an ensemble which merits a choice location in the living room window where ample light and some sun is obtainable.

As a striking example of the effect that can be obtained, consider the accompanying photograph of *Trichocereus Spachianus* as exhibited by Graham Heid, which won for him high honors in a recent Salon.

Although flowers are lacking, the symmetry of the ribs, the star-like clusters of white spines accented by the deep green of the waxy epidermis, and the contrast between the plant and its container make this plant a focal point of attention in any room.

Camera fans amongst our members are advised to enter their photographs of such potted succulents or of any other subjects featuring succulents in the Photo Salon at the Second Biennial Convention of the Cactus and Succulent Society to be held in Cincinnati, Ohio, on June 26th to 28th of this year. For particulars write to the Chairman, W. Taylor Marshall, Desert Botanical Garden, Tempe, Arizona.

The Gardener's Pocketbook

Do You Like Dahlias?

If you are a lover of dahlias as well as of the small "different" flowers, which add so much to flower arrangements, invest the price of an average dahlia tuber in several inexpensive packages of seed of miniature dahlias—the collarettes, the miniatures, Coltness' hybrids, and Unwin's hybrids. Yes, and for the price of a tuber you can be the proud possessor of a number of the "orchid-flowering" or "star" dahlias which are equally easy from seed.

Specimen blooms of the "star" or "orchid-flowering" dahlias often measure 2 to 3 inches in diameter. They are usually two-toned, eight-petaled, with a curling and twisting of the petals so different that often they do not resemble dahlias at all. The plant does not grow over 3 or 3½ feet tall, so fits in nicely with a planting of miniature dahlias.

Dahlia seeds planted in flats or suitable containers in the house 8 to 10 weeks prior to the last spring frost will be sizable plants for setting in the garden when the vegetable seeds are planted. Many of these plants will bloom in 5 months from seed. And what a variety of surprises are in store for you! You will be amazed at the array of hues and tones as well as the variance in sizes and types of blooms—The perfect delight of the flower arranger!

With the first frost, one can either cut back his individual plants and save the plump large tubers which have developed during the growing season, or, he can let them freeze and decay in the ground and repeat the process from seeds the following spring, raising the dahlias as annuals.

The smaller plant of the miniature

dahlia seems desirable from the pest standpoint in that it does not blow over as easily when weakened by borers. Dahlia enthusiasts who live within the corn borer areas have this pest to contend with as well as the ravages of the dahlia borer.

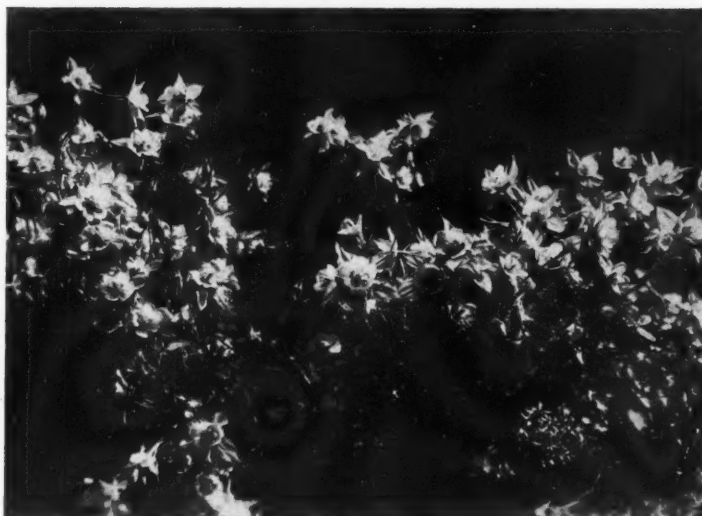
One dahlia authority recommends a 5% DDT spray during the growing season when borer moths are the liveliest. This spray acts as a contact poison and is remarkably weather-resistant, as it requires replenishment only 2 or 3 times during the borer season for maximum effectiveness. Check to be sure that you have purchased the DDT spray without, or with only a small percentage of oil. If it does not kill the plants, it makes them look very sick and retards their growth. And lastly, do *handle* the DDT spray *with care*. It can produce a very unpleasant toxic skin condition for the unwary and those with sensitive skins.

ENA HICKERSON RHOADS,
Mechanicsville, Iowa.

Aquilegia juncunda.

Columbines are definitely not for hit or miss planting on the Great Plains. If any of them thrive permanently in the dryer portions of the Plains without some favoring shade or supplied moisture I have not learned of it. Plains soils are wanting in that mellow richness columbines delight in and Plains summers are hot as well as often unbearably dry. Give them the shade of north walls or of east or west walls with the benefit of eaves water and many of them are adequately accommodated and happy, whatever the soil.

However, no trick of environment or coddling served to grow for me the wonderful blue and white *Aquilegia caerulea* when I brought from my own



Claude Barr

Aquilegia juncunda

plants an ample stock of seed on coming to the western Dakota prairie. Seed obtained from Colorado likewise failed, plants also. One does not relinquish with indifference well-loved friends among the flowers. But in my garden and in my affections a foreigner, a Siberian, *A. juncunda* (*A. glandulosa* var. *juncunda*) now substitutes gloriously and my heart feels no pain. Instead a high exultation.

A. juncunda displays its blue and white in wider banners, with utmost freedom, on a low plant, 24 inches or less. Both flower and foliage are indifferent to the dry air which invades the most protected nooks of Plains gardens—as so many acid soil denizens are not—and my strongly alkaline clay has proved acceptable as well as the compost provided the original lot of seedlings. All with several hours of mid-day shade near a north wall.

After years of delight in this affable columbine I learned that *A. caerulea* had failed for want of acid soil. After

years likewise, I read Farrer on *A. juncunda* for the first time. May I quote! Farrer will always be new and startling and fascinating to someone.

"Above mounds and clumps of vivid green foliage . . . shoot the copious 18-inch to 2-foot stems, each carrying on long graceful footstalks several enormous flowers, very ample and splendid in outline, whose star of broad sepals is richly blue, while the no less broad petals in a wide five-lobed-looking cup at the center, are of a clear and conspicuous white. . . . The royal flowers are not really horizontally borne but seem just a little to nod of their own grandeur, and a dense field-like patch of *A. juncunda*, one foaming sea of green, high over which wave and waver the countless wide stars of blue and white, is one of the most beautiful things that the garden can ever show. . . . A glory of magnificent constitution in any soil that is duly deep and rich and cool, *A. juncunda*, the unquestionable sovereign of the race, annihilating

even *A. caerulea* and *A. alpina*, still further earns our gratitude by always breeding absolutely true."

CLAUDE A. BARR,
Smithwick, S. D.

*An Interesting Palm
From New Guinea*

The immense Island of New Guinea is one of the least known areas in the world, from a botanical standpoint. Its hundreds of square miles of low jungle and high, snow-capped mountains contain thousands of species of unusual and beautiful plants, from several thousand species of orchids to gigantic bananas and epiphytic rhododendrons.

Although New Guinea evidently has a very large number of species of palms indigenous within its boundaries, only one or two of these are in cultivation, and the entire family in the island is only fragmentarily known. Incomplete collections of some of the more prominent species in some parts of the area have been made, but the palm flora of New Guinea is still virtually untouched.

One of these few palms that have reached our gardens is the beautiful and stately *Actinophloeus Macarthuri*. It is rather frequently encountered in an immature state in southern Florida, where the numerous erect trunks and relatively short, shining green leaves are very pretty and form an interesting addition to any planting.

This species was originally described by Herman Wendland in 1879, as *Kentia Macarthuri*. It was named for a Sir W. Macarthur, a garden enthusiast of Australia, who introduced it into that country some time prior to Wendland's time. In 1885, the genus *Actinophloeus* was established by Odoardo Beccari, and the present species was transferred to it. A year later, Nicholson placed it in *Ptychosperma*, a genus to which it is very closely allied. To-



Alex D. Hawkes

day, however, our palm students believe it belongs to *Actinophloeus*.

The genus consists of about a dozen species of slender, usually many-trunked cluster palms, mostly from New Guinea. The group is very little known and there are apparently only two species in cultivation at the present time.

The accompanying photograph shows a mature group of *Actinophloeus Macarthuri* growing at the U.S.D.A. Plant Introduction Garden, Coconut Grove, Fla. Large clumps such as this are not common in the United States, but the palm is also widely cultivated in other parts of the American tropics, and frequently attains this size farther south.

As may be seen in the illustration, *Actinophloeus* has numerous slender trunks, which may attain a number of

twenty or more to a single clump. The trunks are slender and smooth, with prominent nodes at intervals, and reach a height of about 25 feet. The leaves are a glossy dark green color, and, including the petiole, grow to about twelve feet in large specimens. When young, however, they are variable in size and shape. They are gracefully arching, and the individual leaflets are rather stiff and unbending.

Tiny flowers, yellowish-green in color, are produced in abundance on rather short, branched inflorescences. These are followed by small fruits that are first green in color, then yellow, and finally red. The fruit-clusters often contain all three colors, and form a very attractive sight, nestled among the dark green foliage. The fruits eventually fall off, but the little cup-like calyces are persistent; they are rather yellowish in color.

This beautiful palm is very suitable for southern Florida, where it thrives in our poor, sandy soils. It should be much more widely grown, however. It is a very lovely addition to our already rich introduced palm flora. Let us hope that in the near future more species of *Actinophloeus* and other representatives of the New Guinea palms will find their way into our gardens.

ALEX D. HAWKES,
Coconut Grove, Florida.

*From the Midwest Horticultural
Society*

Lotus

The thought of water gardens naturally brings up the one of lotus (*Nelumbium*) and the various stories that have arisen from time to time. The lotus are found in the North American and Asiatic continents. While the American species is not rare, yet its occurrence in quantity gives rise to all sorts of special claims and legends in the region. Most of these are based on

misinformation and overactive imaginations, inspired by the magnificent spectacle of a lotus bed in bloom.

The large bluish green shield shaped leaves, and the big yellow flowers is indeed a spectacle of color, motion, and form. In garden culture the lotus can be readily raised if planted in rich soil with shallow warm water, and protection from winter freezing. They are gross growers and need to be confined in a pool or in a container, if in a large pool. The roots are long and tuberous. They may branch and shoot out growths ten or more feet away from the main plant. Confinement tends to cause a better effect as the leaves are bunched and not scattered, and other plants are not disturbed by the rambling rootstocks.

For exotic effect in the small garden a tub of lotus will attract wide attention and take but a minimum of care.

The native lotus is a light yellow, while the oriental can be had in light and deep pink, and white.

An interesting point of the lotus is that lotus seed from Korea known to be 600 years old has been germinated and produced flowers. These blooms are identical with the wild species still inhabiting the region. This is the oldest known record of seed viability and is authenticated by scientists of the University of Chicago and the Field Museum, who obtained and worked with the seed.

Ostrich Plume fern.

The Ostrich Plume fern which is found native in a wide area of North America is one of the best of native ferns for naturalizing in shady situations. Generally occurring in rather extensive colonies near rather damp spots the plant is a robust grower and may reach five feet in height, although two to three feet is much commoner. This fern is at home in damp shade but

in cultivation has proved able to grow in quite dry shaded situations in stiff soil. Under such adverse conditions the beauty of the foliage is limited to spring months as the dry conditions of mid-summer cause the leaves to gradually wither away. In fall a second crop of leaves may be produced but these will usually be much inferior to the spring crop.

For a good stand in a shaded area add considerable humus to the soil and water during dry spells. This will insure a fine stand of large graceful, bright green leaves that greatly resemble ostrich plumes in shape and appearance.

The leaves are produced from a short upright rootstock and are in a circle and curve gracefully outward from the crown.

Propagation is by division of the crown, which sometimes divides into two plants, or more rapidly by means of the runners which give rise to new plants. These runners are underground so the occurrence of new plants is generally at some distance from the parent plant and may be in most any direction. This habit alone is sufficient to establish a colony in a few years from a small start. This is one of our most versatile ferns and one of the most adaptable for cultivation. Its only drawback being that it must be planted where the new plants from runners will not disrupt other plantings.

This is an excellent plant for those difficult shady spots.

Waterlilies.

Now that the pressure of Victory Gardening has subsided and the critical shortage of building material has somewhat been alleviated in the cement field, thoughts can again turn to pools and the joys of water gardening.

Here in the middle west the depressions and pockets in the heavy soils

lend themselves to the development of natural pools, lakes, and ponds. In addition the ease of creating a water garden in the city with a lack of hoeing, seeding, and watering will have appeal to the overburdened home gardener.

While the culture of waterlilies, which are the mainstay of a watergarden, may seem intricate if the exotic tropical ones are considered the culture of the hardy sorts will prove to be one of the easiest of garden tasks.

Waterlily culture is one of the newer branches of horticulture. The big development has been only in the past few decades since Latour-Marliac of France brought forth the fine hybrids that gave rise to the modern varieties of hardy waterlilies.

Culturally the hardy waterlilies need but a replica of the conditions under which they are encountered naturally. These conditions are: shallow water, from a few inches to three feet in depth; open sunny situation, free from overhanging dense shade; rich soil, as the ooze of the shallow ponds and streams. Duplication of these essentials is simple. A container from a wash tub up, six inches or more of good loam, preferably enriched with rotted manure or some slow acting organic fertilizer, and a sunny spot to place the container. Into this a root of one of the fine varieties is placed and held down with a rock until rooted.

The hardy waterlilies start blooming in late May or June and continue until frost. Even a small tub will contain from one to three or four exquisite blooms daily. As the hardy ones are all day blooming the flowers will open about ten o'clock and close about three. A variation will be noticed in the opening and closing times and the color as the flower ages. Each flower lasts for several days but there should be a succession of buds so that the pool is never without bloom.

Weeding in the watergarden consists of very occasionally removing any green scum that may occur, and in removing the dead flowers and leaves. Watering is needed only to maintain the level lost by evaporation in small ponds. Maintenance consists of adding some fertilizer such as rotted manure, bone meal, or blood meal to the soil in the spring and in providing some small fish for scavenger duty against mosquitos. Scrub goldfish or some of the wild fish will generally prove sufficient for this task. Winter care can usually be reduced to nothing in natural ponds where the water level is about two feet above the soil. In small ponds draining should take place and then a deep layer of leaves or straw placed over the roots. Small pools or tubs can be filled completely for the winter. The roots can also be stored in cool cellars and kept damp until spring.

The varieties are many and can be had in small or large growing sorts to fit every size pool and in many fine colors of pink, white, red, yellow, bronze, and sunset shades.

Truly these fine waterlilies fulfill the wish of every gardener for a garden with as little toil as possible.

ELDRED E. GREEN

Plants Wanted

It will be remembered that there have been some former listings in this column, but there might have been more if members would use it. All are welcome.

Some time I should like to find, "real old-fashioned white, semi-double clove pinks. I cannot find any description that seems to fit the plant I want, in my catalogues. We used to have these "pinks" in our garden. Hardy perennials fairly unassuming in appearance but, oh, so fragrant!

I would "swap" a few hyacinth

bulbs, puschkinias, or gardenia-flowered narcissus (not guaranteed to bloom every year) or I would pay cash.

MRS. H. R. SELDEN,
Elm Place, Avon, N. Y.

Amsonia Tabernaemontana

Though this stout perennial has long been known it has not met a warm reception from our gardeners. I have seen it in only three gardens besides my own. Gray gives its habitat as "Low grounds, Pennsylvania to Missouri and southward, introduced in New Jersey." He also says it was "named for Dr. Amson, physician of Gloucester, Virginia, in 1760, and a friend of John Clayton." It sounds as if there is a story behind that last quotation. The plant comes up a little late, many fat stalks pushing through the dried stubble of last year's growth. Its abundant willow-like leaves are smooth dark green; its stems which reach a height of two or three feet spread a little as they elongate, making a plant as large as a vigorous peony. These multiple stems, lacking the rigidity of phlox, have grace and movement, and yet I have never seen them beaten to earth even by storms which wreck the phlox. By late May or early June small light slaty blue flowers open in crowded terminal panicles to be followed by erect slender green pods which the botanists call follicles. All through the summer its nice clean green trims the border but its greatest beauty is yet to come. In October, when every other perennial has been cut down and the border shows only the fall growth of such low things as the ajugas, Johnny-jump-ups, and forget-me-nots, Amsonia still holds aloft every stem with all its leaves and every leaf takes on the luminous yellow of aspens in the fall. The four plants along my driveway often hold this

glowing color for two weeks and people stop to look and say, "What in the world is that?"

MARY JUDSON AVERETT, N. J.

Wanted: seeds, seedlings or cuttings.

Arctous ruber, *Arctostaphylos columbiana*, *Arctostaphylos tomentosa*, *Bruckenthalia spiculifolia alba*, *Cassiope fastigiata*, *C. Mertensiana*, *C. stelleriana*, *C. tetragona*, *Gaylussacia dumosa*, *Cladothamnus pyrolaeifolia*, *Empetrum nigrum* var. *purpureum*, *Enkianthus* spp. except *E. campanulatus*, *Kalmia latifolia* var. *myrtifolia*, *Kalmiopsis leachiana*, *Lyonia mariana*, *Menziesia ciliicalyx*, *M. ferruginea*, *M. pentandra*, *M. pilosa*, *M. purpurea*, *M. glabella*, *Phyllodoce Breweri*, *P. aleutica*, *P. glandulosa*, *P. nipponica*, *Rhodothamnus chamaecistus*, *Vaccinium crassifolium*, *V. japonicum*, *V. myrtillus*, *V. parvifolium*, *V. scoparium*, *V. stamineum*.

DR. HELEN C. SCORGIE,
Still River, Mass.

Wanted: plants.

Symplocos paniculatus, *Ampelopsis heterophylla* var. *amurensis*.

ELEANOR HILL,
Tulsa, Okla.

Revivals?

Whether or not this is actually a period in which we are having revivals of interest in old plants that had more or less dropped out of common cultivation, is a moot question. This column has repeatedly, during the last five years, spoken of the use of colored leaved caladiums in pot for summer decorations. At the Flower shows this season, there were several opportunities to see potted plants of these color-

ful plants in more than one exhibit. In the stand where roots were for sale, there were not many offerings in which one could pick out the varieties by name.

This is rather too bad as not all of the varieties are of equal interest.

In some of the wholesale catalogues of materials for the present year, there are color plates of leaves, shown in a wonderful tapestry of design, one overlapping another, and of course in some cases, with individual leaves that were of far greater interest than others.

Quite aside from the cool beauty of the green venations over white grounds, there are innumerable sorts in which there are as tender pinks and clear rose reds as one could wish for. And one recalls the day when there were whole catalogues devoted to the collections of this one plant. Not only did one find such lists from abroad, but in Florida the late Henry Nehrling had his own fine collection, a collection which is being approximated once again among the modern growers.

Recently in a catalogue from India, it was interesting to see such names as Bertha M. Bower, Caloosahatchi, Chas. E. Hendry, Crescent City, Crescent Queen, Dr. H. Nehrling, Hildgard Nehrling, Mocking Bird and many another that can mean only Florida originations.

Perhaps the time will come again when we will have as much interest as once before and whether we live in regions where these can be used in the open, or whether we have to be satisfied with the plants in pots, there will always be varieties to intrigue almost any taste.

Gloxinias once more are coming into regular production and growth and it is no surprise to see named clones offered that make one think of Europe again.

Postscript

In a recent flying trip to North Carolina, one of the sights that brought back the thought of my own sheets of snowdrops, was a fine planting of *Tritelia uniflora* known to some as *Brodiaea uniflora*. Whatever its name, it is no substitute for the snowdrop for any one who has a romantic attachment to that charming bulb, but for the gardener who lives so far south that the snowdrop will not endure the lack of winter, the garden effect is not unlike. To be sure the green undertone that makes the whiteness of the snowdrop something separate and apart among its kin, is replaced in the tritelia by a tone of lavender which may become strong enough in some cases to warrant the varietal name of *caerulea*. There was a good picture of this some years ago in the Magazine but for those who have not that copy, let it be said that the flowers are about the size of a quarter dollar, with six pointed perianth segments that make a fine six pointed star of the corolla. The color if present is deepest in the tube of the flower, running faintly along the mid-fold of each segment and stained more heavily on the reverse. The leaves are grassy, not erect as in the snowdrop, and if one must walk on them will give off the faint odor of garlic. Like other bulbs, it loses its foliage in mid-summer and again like some others shows a tendency to make some leaf growth in the autumn.

Another bulb familiar from northern gardening but apparently flourishing in the South is the squill which is the more lusty counterpart of the "blue-bell" of the English, not the Scots. Whether one call this *Scilla campanulata* or *S. hispanica* again will make little difference in the garden aspect of this hardy bulb. No flowers were ready

on the bulbs in this planting but surely another ten days of decent weather would bring them into full perfection.

Here in the garden, the editor's garden, the effect of this squill is to be had when only the latest of the narcissus are left in flower. One wonders if it will make flowering in Wilmington, with the Kurume azaleas which make so excellent a shelter for it?

As a gardener from the North and one keenly interested in bulbs, the editor always watches the "yards" elsewhere to see what is in flower. Through the sandy "yards" of the coastal plain, there were many jonquils and jonquils in the true sense of that word, *Narcissus jonquilla* and many campernelles that seemed not to fit too perfectly the book descriptions if one could carry them all in his mind's eye.

Along this stretch not a sign of the slender hyacinth that makes such a characteristic touch in gardens further inland. Of the fat Dutch hyacinths bred for winter forcing there were many in all the stages of relaxation that comes after the first show-off year.

Snowflakes or leucojums grew in fine array but did not show the lush quality that they have on fatter land.

Among the flowering shrubs the northern eye looks with some envy on *Jasminum primulinum* which is not winter hardy here and then recalls that our forsythias will make a braver show than either and that the naked jasmine is not to be despised even if one cannot grow the more ample southerner. Of Japanese quince varieties there seemed to be relatively few, which is too bad, since they bloom intermittently during the winter and with the open growth habit make a delightful foil for the too solid citizenry of the fat camellias. Their colors also fit into the same tonalities far better in fact than do the

colors of the azaleas which too often are their bedside companions!

In a recent number of *Garden Gossip* there was a brief note of the beauty of the winter sweet, *Chimonanthus fragrans* and the writer spoke as if the plant had become a small tree. That again is a matter for envy in the north where it must grow as a bush if at all. What a delightful prelude it would make with its delightful scents for those to come later in tea olive and Indian daphne. The Japanese call it Ro-bai, which I am told suggests yellow plum, since the tree is a winter bloomer overlapping the season of the *mumes* which we think of as apricots as much as plums.

As one goes through the gray and green loveliness of Brookgreen, one could wish for an unexpected sight of a tree or two since the yellow petals are translucent and would not give even the strong yellow that will later come with the Carolina jessamine, wreathing the brick walls.

It would not be out of place either in general feeling, for as one walks through these gardens the strange gray color that one finds in towns of north China keeps coming to mind although there are few other similarities.

It was interesting to discover in another garden, a fine bush of *Osmanthus delavayi*. That is a fine variation over the other more commonly met species since it has small leaves and if there is any captious remark to make about the camellia gardens "en masse" it is that the leaf unit of the camellia is not often enough relieved by other broad-leaved evergreens with larger and with smaller leaves. There are not many such in common use and it is perfectly true that none is of astonishing beauty in itself, but they would all relieve the camellia

growth and habit pattern, making the camellia look even better than it is!

What a task it must be for the gardener in the South to maintain an adequate supply of humus in his garden beds. And what a delicate task he must have to manage the balance between solid cover of planting and restful even spaces where ground covers other than grass can have their share in the design. Even the pale green of autumn-sown rye grass is worth the effort for the beauty that it brings into a design that often is heavy with dark greens.

Another thing that the editor likes to do is to look at the house plants that people like to grow, and not those that have been paraded at flower shows or photographed in the "smart" magazines in setting which have been whipped up for the photograph on the occasion.

It is in these unstylish places where one often finds plants that are not expected.

For home gardeners who might willingly or even furtively admit that they like what they grow in their windows, a brief look through a recent Florida catalogue showed three species of *Jacobinia* a plant that the editor knew as a boy in a "not-smart" collection of house plants in the old species, *J. velutina*. Here were offered *J. coccinea* with crimson flowers and *J. Ghiesbreghtiana* which is reported to have "tubular flowers" of "brilliant orange yellow." These might be worth looking for, even remembering the mealy bugs!

And you who have put up with the routine varieties of Pothos, etc., from the ever-useful dime stores, what do you know about *Philodendron lacerum*, *Syngonium aetum*, *Nephtytis liberica* and so on and so on?

